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Original Articles.

THE WASSERMANN TEST.

I. WASSERMANN TESTS IN A BOSTON MATERNITY HOSPITAL.

BY DAVID L. BELDING, M.D., BOSTON, AND
CHARLOTTE B. ADAMS, BOSTON.

[From the Evans Memorial.]

WASSERMANN surveys upon hospital or dispensary patients who suffer from various pathological conditions including syphilis, do not represent the normal incidence of syphilis or the true per cent. of positives among the so-called healthy population. Theoretically, maternity cases which present a physiological rather than a pathological condition, more closely approximate the normal. Practically, changes in the blood of the pregnant woman so affect the test that maternity patients are no more representative than ordinary hospital cases. In spite of this fact and with the additional knowledge that statistical deductions from small groups are more or less untrustworthy, it seems fitting to present a series of 5198 maternity cases on whom routine Wassermann tests were made at the Robinson Memorial, Massachusetts Homœopathic Hospital, Boston, in the hope that it may add to the rapidly accumulating mass of evidence regarding the extent of syphilis among various classes of society. It is also of interest, in that

it touches directly upon the great question of congenital syphilis.

Syphilis and the Wassermann Test.—It is a matter of common knowledge that the Wassermann test, based on a non-specific fixation, does not detect all cases of syphilis. Negative tests are frequently obtained in syphilites, particularly in old or treated cases, and infrequently positive reactions are obtained in other diseases. Therefore, a Wassermann survey, although the most reliable method at our command for determining the existence of syphilis, does not represent the actual extent of the disease in a community, and the incidence thus determined must be interpreted from the standpoint of positive Wassermann tests rather than the number of syphilites.

It should be clearly understood that the statistics in this paper are the results of a Wassermann survey among pregnant women and do not represent the actual incidence of syphilis in greater and suburban Boston. Neither are they comparable with a Wassermann survey of a similar body of non-pregnant women, owing to certain technical variations in the reaction due to pregnancy, upon which preliminary studies are now under way.

In latent or hidden syphilis, the type ordinarily found in maternity cases, Craig¹ found that 32 per cent. gave a negative Wassermann test. Thus a Wassermann survey underestimates the number of cases which have had or still have clinical syphilis. Ordinarily with cholesterolized

antigens, comparatively few non-syphilitic fixations are obtained; but in maternity cases this number is increased, approximately ten times, while the number of syphilites with negative tests remains unchanged. Curiously, these errors so balance in maternity cases that the per cent. of positives approximates the actual number of syphilites in a community, even though all cases of syphilis are not detected and a corresponding number of non-syphilites is included.

Technique.—In all studies regarding the prevalence of syphilis by means of the Wassermann test, the method of performing the test and the type of antigen should be carefully recorded. Otherwise subsequent comparisons are impossible owing to technical differences in determining what constitutes a positive Wassermann.

During 1917 and 1918, 2470 routine cases were run with a special technique in which a cholesterolized and an acetone insoluble antigen were used. During 1919 and 1920, 2728 cases were tested by the standard method of the Massachusetts Department of Public Health with two cholesterolized antigens. (Hinton.²) Our statistics, unless otherwise specified, are based upon a 0.4 per cent. cholesterolized beef heart antigen, which was used throughout both series. The close results with the same antigen, the per cent. of positives being 9.1 for Series I and 9.3 per cent. for Series II, suggest that the actual technique of performing the test is perhaps less important than the type of antigen and the method of reporting.

The two methods which are compared in Table No. 2, differed chiefly in regard to the total volume, preliminary titration of serum and method of reporting, although based upon the same hemolytic system and upon similar principles. In Series II the standard method of the Massachusetts Department of Public Health was followed, except in the number of antigens and the method of reporting. Whereas in the State Wassermann Laboratory three cholesterolized antigens are employed and the results are reported as positive when all three give complete or moderate inhibition, doubtful when antigens A and B show 75 per cent. hemolysis, with slight or no hemolysis with C, and negative when all three give complete hemolysis; in Series II, two cholesterolized antigens, one of which for a short period was replaced by a plain alcoholic, were used and the positives were graded according to the time-honored but unsatisfactory 1 to 4 plus system.

The particular cholesterolized antigen upon which the statistics are based, through the courtesy of Dr. W. H. Hinton of the Wassermann Laboratory, Massachusetts Department of Public Health, has been compared with the standard State antigen on 108 questionably syphilitic cases. Agreement resulted in 95 cases while the St. antigen proved stronger in 4 and weaker in 9. In 78 cases, positive with one or

both antigens and also positive with a third, the State standard was positive in 96.1 per cent. and our antigen in 97.4 per cent. Except for an occasional weaker reaction with one or the other, the two antigens may be considered practically of equal strength and value.

TABLE NO. 1.

Antigen.

	Cholesterolized Antigen No. 1.				
	Posi- tive.	Moder- ate Posi- tive.	Weak Posi- tive.	Nega- tive.	Total.
Standard					
Choles- terolized					
Antigen					
of Massa- chusetts					
Positive	57	2	—	—	59
Moderate					
Positive	2	1	—	—	3
Weak					
Positive	1	3	7	2	13
Negative	—	—	3	30	33
Total	60	6	10	32	108

Eighty-seven per cent. of the laboratory work was performed by the same technician, thus largely eliminating the personal equation. The blood was taken in the prenatal clinic and in the delivery room. Tests were run twice a week in Series I, and three times in Series II.

Results.—Positive reactions of varying degrees were obtained in 9.2 per cent. of cases, of which 7.8 per cent. would have been reported as positive in laboratories where doubtful reactions (1-plus) were disregarded, and 4.6 per cent. were strongly positive. The total number of negroes, 3.5 per cent. of all patients, is too small to cause any appreciable change in the per cent. of positives. The minor differences between the two series in Table No. 3, is largely due to the different method of reporting, an eight-point system being used in Series I and a four-point system in Series II.

Clinical Syphilis.—The positive cases have been classified clinically as (A) *Definitely Syphilitic*, when there is no possible doubt as to the clinical diagnosis; (B) *Suspicious*, when there are several suggestive symptoms but the evidence is not conclusive; (C) *Suggestive*, when a single symptom or sign suggestive of the disease is present; and (D) *No Indication*, when no clinical evidence can be obtained. The statistics are given on a basis of 4988 cases rather than the original 5198, owing to the fact that in Series I only 207 of the 224 positive cases examined in the prenatal clinic entered the hospital for delivery. They are arranged according to the inclusion or exclusion of the findings in the child of the present pregnancy. In general "Exclusive Child" refers to the clinical evidence available at the prenatal clinic and "Inclusive Child" includes the total clinical evidence at the time the patient leaves the hospital.

The small percentage of cases which give clinical evidence of syphilis is in accord with the findings of most investigators of syphilis in

TABLE NO. 2.

Technique.

	Series I.	Series II.
Fixation	Waterbath @ 37½° C.	Waterbath @ 37½° C.
Hemolytic System		
Cells	Sheep	Sheep
Amboceptor	Rabbit	Rabbit
Complement	Guinea-pig	Guinea-pig
Volume	1/5 original Wassermann	½ original Wassermann
Measurements	In bulk	In bulk
Preliminary Titration		
Method	Cross-titration varying both amboceptor and complement	Combined
Time	30 minutes	30 minutes
Antigen	Without	Without
		For purpose of testing antigen an extra titration with antigen is run
Negative sera	Without	Without
Cells	5% sensitized with same amount amboceptor as in preliminary titration	5% sensitized with 2 units of amboceptor
Complement	1½ units	2 units
Serum		
Number of tubes	4	1
Amount in c.c. in terms of original Wassermann Test	0.2, 0.1, 0.05, 0.025	0.2
Control	0.4, 0.05	0.4
Inactivation	30 minutes @ 55° C.	30 minutes @ 55° C.
Allowance for anti-sheep hemolysin	Partial	None
Time		
Fixation	45 minutes	40 minutes
Incubation	60 minutes	60 minutes
Antigens		
Number	2	2
Source	No. 1 Beef heart	No. 1 Beef heart
Type	Cholesterolized	Cholesterolized
	No. 4 Beef heart Acetone Insoluble	No. 2 Human heart Standard Massachusetts Cholesterolized
Ratio antigenic to anticomplementary dose	1:15	1:60
Ratio amount used in test to anticomplementary dose	1:5	1:10
Antigenic units	3	6
Reading	1 to 4 plus for each tube, representing 75, 50, 25 and 0 per cent. hemolysis	1 to 4 plus for a single tube

TABLE NO. 3.

Per Cent. Positive.

	Series I.	Series II.	Total.	
			Negro and White.	White.
Total cases	2470	2728	5198	5022
Positive cases	224	254	478	448
Per cent. positive, all grades	9.1	9.3	9.2	8.9
4-Plus	4.2	5.0	4.6	4.5
3-Plus	1.9	1.0	1.4	1.3
2-Plus	2.0	1.6	1.8	1.7
1-Plus	1.0	1.7	1.4	1.4
Reportable (4, 3, 2-plus)	8.1	7.6	7.8	7.5

TABLE NO. 4.

Clinical Syphilis.

	Exclusive Child.			Inclusive Child.		
	Series I.	Series II.	Total.	Series I.	Series II.	Total.
Cases	207	254	461	207	254	461
A. Definitely syphilitic	4.8%	6.7%	5.9%	9.2%	10.2%	9.8%
B. Suspectious	9.7	13.4	11.7	15.5	23.6	19.9
C. Suggestive	21.3	21.6	21.5	22.7	27.2	25.2
D. No indications	64.2	58.3	60.9	52.6	39.0	45.1

women. Since these cases chiefly represent "hidden" syphilis, it is difficult to obtain clinical evidence of the disease even by most careful questioning as to history, children, symptoms, fetal deaths, etc. As a rule the patients have no knowledge of, or show no signs of syphilitic infection. With all available information only 9.8 per cent. can be classed as definitely syphilitic and 19.9 per cent. more as probably syphilitic, while at the prenatal clinic these figures fall to 5.8 and 11.7. It is indeed a marked contrast to syphilis in the male that less than 10 per cent. of females give definite clinical findings, less than 20 per cent. more present suspicious symptoms or histories, and 45 per cent. give no indication whatever. For reasons previously stated concerning the Wassermann test in pregnant women and the probable inclusion of non-syphilitics, the 10 per cent. represents a minimum figure.

The variation between the two series in the per cent. of definite and suspicious syphilis, demonstrates the need of using large numbers of cases in the compilation of medical statistics.

Comparative Statistics.—The results of routine Wassermann tests upon pregnant women in nine other cities have been collected from the literature. With one exception only cities reporting five hundred or more cases have been included. While the average of 9.03 per cent. for 16,639 cases is practically the same as 9.2 per cent. for Boston, it would fall considerably below this figure if the large number of negroes in Baltimore (50 per cent.) and in Washington (77 per cent.) were eliminated. It would seem that our 7.8 per cent. for reportable positives (eliminating the doubtful 1-plus reactions), closely approximates the general incidence of positive Wassermanns in this class of patients.

TABLE NO. 5.
Comparison of Cities.

Cities.	Total Cases.	Per Cent. Positive.
Ann Arbor—3, 4.....	1,024	5.8
Baltimore—5.....	4,000	11.2
Brooklyn—6, 7.....	2,714	8.0
Chicago—8, 9, 10.....	437	8.0
London—11.....	677	3.9
Minneapolis—12.....	857	6.2
New York—13, 14, 15.....	4,882	8.0
Paris—16.....	1,185	4.4
Washington—17.....	863	27.8
Total.....	16,639	9.03

Comparisons of this kind, even with comparatively large numbers, are of little value, owing to different methods of performing the test and variations in the source of material. For this reason all Wassermann statistics should be accompanied by the method of performing the test and a description of the subjects and their environment. In order to show the necessity of recording certain information relative to the patients, and for the purpose of presenting our

statistics for future comparisons, the influence of the following conditions is considered: I. Individual Variation, (1) Age, (2) Time married, II. Nationality. III. Social and Economic Position, (1) Wealth, (2) Occupation of husband, (3) Residence.

Individual Variation.—An accurate comparison of syphilis in women cannot be made unless groups of approximately the same age and length of married life are selected. For this reason the excellent records for Boston of Solomon and Solomon,¹⁸ upon women averaging 37 years old and married 11.09 years, which were selected from the standpoint of neurosyphilis, cannot be compared with the present series of younger women. Presumably since a large per cent. of syphilis in women is acquired through the husband, the older the patient and the longer the period of married life, the greater becomes the opportunity for infection.

(1) **Age.**—The distribution according to age, as shown in Table No. 6, indicates that nearly 80 per cent. of the patients at the Robinson Memorial Hospital were comparatively young women under 30 years. The average age of 461 positive cases was 26.52 years and of 500 negative 26.16.

TABLE NO. 6.

Age.		Per Cent. Positive.	
Age.	Distribution per 1000.	Series I.	Series II. Total.
15-20 years	136	8.8	8.6 8.7
21-25 "	386	9.6	8.8 9.2
26-30 "	271	8.1	9.4 8.8
31-35 "	129	7.7	9.5 8.7
36-40 "	64	11.3	11.3 11.3
41-45 "	13	19.4	14.7 16.9
46-50 "	1	0.0	33.3 14.3

If active syphilis were under consideration certain ages would probably show an increased number of positives, but since the Wassermann test includes all stages of the disease we should expect, in view of the longer period of exposure, a greater per cent. with advancing years, particularly if we assume that increased age is comparable to longer married life. The smaller number of cases above 35 years in some measure accounts for the unusually high per cent., but 00 cases are at least sufficient to warrant the conclusion that the older women show an appreciable increase in the number of positives.

Series II gives a steady rise with increasing age, but Series I shows an unexpectedly high rate in the 21-25-year group. Naturally we should expect to find a greater number of active syphilis during this period, which corresponds to the first years of married life, but more probably it denotes statistical error due to insufficient data.

(2) **Time Married.**—Comparing 461 positive cases with 503 negative, comprising the same nationalities, the negative series shows a greater number of primipare, 44.6 per cent. vs. 38.6 per

cent., and correspondingly a shorter average period of married life, approximately 2 months. In these cases the average number of conceptions was 2.46 for the positives and 2.22 for the negatives, which indicates that in fertile women syphilis has no influence on the number of conceptions. The greater number of multiparae and the longer period of married life in the positive series, show that the latter exerts some degree of influence upon the percentage of positives. However, these figures are merely suggestive, since it is assumed that the two groups of 500 and 461 represent the correct average for all negative and positive cases.

Nationality and Race.—The influence of race and nationality, particularly in the case of the negro, is of sufficient importance to demand separate consideration, and for that reason only a single table for the purpose of interpreting our statistics is presented here. Except in the case of the Negro and the Jew the nationality is determined by the birthplace of the patient.

TABLE NO. 7.
Race and Nationality.

Nationality.	Distribution per 1000.	Per Cent. Positive.
Negro	35.2	17.1
Greek	7.4	16.2
Armenian	9.2	13.6
Scotch	12.0	10.0
American	553.1	9.4
French	2.2	9.1
Romanian	2.2	9.1
Canadian	96.9	8.9
Irish	79.9	8.8
Germanic	10.2	7.8
Jewish	112.2	7.4
Serbian	16.6	7.2
British	35.9	6.7
Slavic	4.6	4.4
Turkish	6.2	3.2
Italian	10.6	1.9
Miscellaneous (11 nations)....	5.6	17.9

Social and Economic Position.—The social and economic status of the patient may be shown indirectly by the financial condition, the occupation of the husband and the residence. Owing to local interest, special attention is given the distribution of cases in greater and suburban Boston.

(1). **Wealth.**—The price paid for hospital accommodations, while not an absolute indication of the financial condition, nevertheless gives a fairly representative idea of the resources of the patient. The patients may be grouped into three main classes, according to the hospital charges effective in 1917.

TABLE NO. 8.
Financial Status.

Weekly Hospital Rate.	Distribu- tion per 1000.	Per Cent. Positive. Negro and White.	White.
Free and Reduced	99	11.1	10.7
\$12.00 to \$15.00	742	9.1	8.7
\$17.00 to \$21.00	159	8.6	8.6

There is but little difference between the grades of paying patients, but a decided difference, 2 per cent., between the semi-charity cases and the independent cases. The elimination of the negro causes practically no change in this situation, and the conclusion may be drawn that the prevalence of syphilis in some measure depends upon the financial status of the patient.

(2). **Occupation.**—Classification of the husband's occupation presents rather surprising results. Indoor occupation ranges higher than outdoor, clerical work giving the highest percentage, 15.1. Unskilled labor gives 11.4 per cent., as compared with 8.6 per cent. for skilled. Mechanical and manufacturing, 8.6 per cent., and public service, 7.8 per cent. are below the average, and unmarried women, although few in number, have an unexpectedly low rate, 4.8 per cent. Evidently the percentage of syphilis varies in different occupations, but in general it follows their economic status. These figures again emphasize the necessity of care in comparing statistics regarding the prevalence of syphilis.

TABLE NO. 9.

Occupation.	Per Cent. Positive.	
	Distribu- tion per 1000.	Negro and White.
Agriculture, Forestry and Fishes	11	8.9
Clerical	45	15.1
Domestic and Personal	64	9.4
Manufacturing and Mechanical	445	8.6
Professional	30	10.7
Public Service	72	7.8
Trade	160	9.5
Transportation	143	10.2
Unmarried Women	25	4.8
Not given	4	5.0
No occupation	1	0.0

(3). **Residence.**—Ordinarily the residence of the patient has little direct bearing upon her economic or social condition, owing to the mixed residential character of each community. Except in a few cases it would be manifestly inaccurate to draw conclusions in comparing one community with another, unless the general social status was markedly different. Likewise, comparisons to be accurate should be based on large numbers which are not available for the individual suburban towns. However, statistics showing the per cent. of positive Wassermann tests in different parts of suburban Boston are perhaps of local interest and may be presented here with the provision that no unwarranted conclusions be drawn. The figures for other cities (Table No. 6), while of interest as statistical compilations of various institutions, with the exception of New York, scarcely warrant comparison with Boston, which is a port of embarkation and debarkation in close touch with foreign shores and possessing a comparatively large mixture of foreign-born population.

TABLE NO. 10.

Zone Distribution.

Residence.	Distribution per 1000.	Per Cent. Positive.			
		All Degrees.	Negro and White.	Negro and White.	Strong.
Boston, Central District.....	221	10.8	10.2	5.7	5.4
Boston, excluding Central District.....	447	9.2	9.2	4.6	4.6
Suburbs within eight-mile radius.....	277	8.5	7.8	3.8	3.5
Outside Suburban Boston.....	55	6.6	6.7	4.8	4.8
Greater Boston.....	668	9.8	9.6	5.0	4.9
Boston and Suburbs within eight miles.....	945	9.4	9.0	4.6	4.5
Boston and Suburbs, excluding the Central District.....	724	8.9	8.7	4.3	4.2
All localities.....	1000	9.2	8.9	4.6	4.5

Ninety-four and one-half per cent. of all house cases admitted to the Robinson Memorial Hospital from 1917 to 1920, inclusive, came from Boston or suburbs within an eight-mile radius, so that for all practical purposes the entire series may be considered as coming from one locality.*

Greater Boston	96.8%
Suburbs within 8 miles	27.7
Massachusetts	4.7
United States	9.7
Canada and Mexico	9.1

100.0%

(a) *City vs. Suburbs.*—The striking fact in the residential distribution of syphilis is the higher urban rate.⁶ Irrespective of groupings, the central district of Boston, comprising the North, South and West Ends, always gives the highest per cent. Greater Boston exceeds the surrounding suburbs, and they in turn the rest

of Massachusetts. These facts cannot be explained from the standpoint of nationality or race, since the exclusion of the negro, the only appreciable factor, does not materially affect the per cent. of positives. On the basis of the cost of hospital room, the central Boston patients are upon the same financial level as the greater Boston and suburban for both positive and negative cases, and the semi-charity cases, which had the highest per cent. of positives, are equally distributed. No other explanation seems tenable except that syphilis is more prevalent in central Boston among the women who enter the hospital as house cases, than in the same economic class of patients from the suburban districts.

(b) *Suburban Distribution.*—Further information may be gained by arranging the residential districts and suburbs of Boston into geographical groups.⁶ In so doing, however, the decreased number of cases makes the results of relatively less value.

(c) *Social Status.*—If we divide the thirty cities and towns into four classes, according to the social standing of the population, a corresponding difference is found in the percentage of positives. Naturally, this arbitrary division is somewhat dependent upon the person making the classification, since cities and even towns contain several social strata, but all observers would agree upon the difference between the highest and lowest class. In order to eliminate all possible error, only the white race has been considered. The results indicate that the social and intellectual standing of a community is

TABLE NO. 11.
Geographic Distribution.

Residence.	Distribu- tion per 1000.	Per Cent. Positive.			
		All Degrees.	Negro and White.	Negro and White.	Strong.
Boston, Central District.....	221	10.8	10.2	5.7	5.4
Northeast of Boston.....	49	9.9	9.9	5.4	5.4
North of Boston.....	130	9.2	8.7	4.5	4.4
Northwest of Boston.....	120	9.0	8.7	3.7	3.2
West of Boston.....	50	8.4	8.1	4.0	3.6
Southwest of Boston.....	182	8.6	8.7	4.5	4.2
South of Boston.....	167	8.7	8.7	4.0	4.0
South of Boston.....	26	10.1	10.1	5.4	5.4
Outside sub-urban Boston.....	55	6.6	6.7	4.8	4.8

*Boston, excluding central district, comprises Allston, Brighton, Charlestown, Dorchester, East Boston, Hyde Park, Jamaica Plain, Mattapan, Readville, Roslindale, Roxbury, South Boston and West Roxbury.

The suburbs within a radius of eight miles are: Arlington, Belmont, Braintree, Chelsea, Everett, Malden, Medford, Melrose, Milton, Newton, Quincy, Revere, Somerville, Watertown, Waverley, Winchester and Winthrop.

TABLE NO. 12.
Social Distribution.

Class.	Cities and Number		Per Cent. Positive.	
	Towns, per 1000.	All Degrees.	Strong.	
High	8	38	7.6	3.7
Medium High	9	121	8.0	3.8
Medium Low	7	435	8.4	4.1
Low	6	351	10.3	5.7
Total	30	945	9.0	4.6

*Northeast, East Boston, Winthrop, Revere; North, Charlestown, Chelsea, Everett, Malden, Medford, Melrose; Northwest, Winchester, Somerville, Arlington, Cambridge, Belmont, Waverley, Watertown; West, Allston, Brookline, Brighton, Newton, Jamaica Plain; Southwest, Hyde Park, Mattapan, Readville, Roslindale, Roxbury, West Roxbury; South, Dorchester, Milton, Quincy.

TABLE NO. 13.
Residential Distribution.

Residence.	Distribu- tion per 1000	Per Cent. Positive.			
		All Negro and White.	Negro and White.	Strong Negro and White.	White.
1. East Boston	21	13.7	13.7	6.9	6.9
2. Charlestown	31	11.5	11.5	6.4	6.4
3. Cambridge	59	11.2	9.6	4.7	3.8
4. Boston, Central District	221	10.8	10.2	5.7	5.4
5. South Boston	26	10.1	10.1	5.4	5.4
6. Chelsea	32	9.3	8.8	5.0	5.0
7. Dorchester	149	9.0	9.0	4.3	4.3
8. Revere	20	8.9	8.9	5.0	5.0
9. Roxbury	161	8.5	8.7	4.1	4.1
10. Everett	29	8.4	6.6	2.8	2.2
11. Medford	21	8.4	8.5	2.8	2.8
12. Somerville	48	6.7	6.7	2.5	2.5

closely associated with the prevalence of syphilis.

The various communities which have furnished at least 100 patients may be arranged according to the per cent. of positives, but it should be remembered that statistics from small groups are unreliable.

SUMMARY.

1. In 5198 routine cases in a Boston Maternity Hospital, the Wassermann test showed some degree of positivity in 9.2 per cent., was definitely positive in 7.8 and strongly positive in 4.6.

2. Only 9.8 per cent. of the positive cases gave definite clinical evidence of syphilis, although an additional 19.9 showed suspicious findings.

3. Positive Wassermann tests, with cholesteralized antigens, in pregnant women are not comparable to similar tests in non-pregnant, owing to certain blood changes, and therefore do not either represent the actual incidence of syphilis in a community or the per cent. of positive tests in healthy non-pregnant women.

4. Statistical studies from various cities cannot be accurately compared, owing to differences in technique and material. For reference all Wassermann surveys should be accompanied by a statement of the method of performing the test and a description of the status of the patient.

5. Owing to longer exposure, the per cent. of positives increases with age and length of married life.

6. The high incidence of syphilis in the negro, twice that in the white race, necessitates the exclusion of this race in certain statistical comparisons. The prevalence of syphilis varies with different nationalities.

7. The per cent. of positives increases inversely as the wealth of the patient, and also differs according to occupation.

8. In Boston the urban rate is higher than the suburban and the highest class residential districts show the lowest per cent. of positives,

which, in this instance, explains the lower suburban rate.

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CHANGES THAT HAVE OCCURRED IN
THE PAST 25 YEARS HAVING AN
EFFECT ON THE PROGRESS OF
MEDICINE.*

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TWENTY-FIVE years ago last October, fresh from school and hospital, I came to Worcester and, to use the popular phrase, "hung out my shingle." During this period many changes have occurred in our ideas about some diseases and in the manner of treating many, and it has seemed to me that it might be interesting to review some of these changes and possibly prophecy some into the future. Influences within, as well as without the profession, have worked to bring medicine to its present standard, and will, in the future, exert, more than ever, an unavoidable effect on our work and our ideals.

To begin with, let me recite some of the conditions under which I was educated, and the views held at that time about some of the common diseases. In doing this I shall have to apologize for being personal somewhat, and for citing facts and incidents confined to this particular region, but I have no doubt that what I have to say, by merely changing names and things peculiar to any locality, could apply to a practitioner in any other section of the country.

Twenty-five years ago the Harvard Medical School occupied the one building on the corner of Boylston and Exeter Streets. The class that I was enrolled in was the last class to go through on the three-year schedule. A college degree was not required as an entrance qualification. The faculty included such men as E. M. Wood in chemistry, Thomas Dwight in anatomy, Councilman began his first year in the chair of pathology with my class. F. C. Shattuck and Mason headed the list in clinical medicine, and R. H. Fitz had just been transferred to the chair of theory and practice. David Cheever had just resigned the chair of surgery and J. Collins Warren had taken his place. Maurice

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Richardson was Professor of Clinical Surgery. William Richardson was Professor of Obstetrics, and Thomas Rotch, Professor of Children's Diseases. All these men held prominent positions in the various hospitals.

The Massachusetts General and the Boston City were the two leading hospitals where we went for clinical teaching. At that time the number of internships in the various hospitals was such that, I venture to say, not more than one-half of each graduating class could be given the opportunity for hospital work. Today the Medical School is in its present palatial quarters and is surrounded by a new group of hospitals which, with the older hospitals, gives it a capacity for teaching hardly realized twenty-five years ago. The number of internes in all these institutions has been so largely increased that opportunity is given to nearly every student to round off his education by hospital training.

Outside of Boston the Worcester City Hospital was then looked upon as one of the most attractive, two of my own classmates coming up here for their hospital training. In Worcester itself there were four general hospitals. The City, which then consisted of K, F, G and M, with C and D and the Winslow Surgery as very recent additions. The out-patient was confined to the two or three small rooms in the basement of the Administration Building. The Memorial Hospital was then confined to the present Administration Building and the building next to it, now C and M, I believe, and the out-patient Washburn Free Dispensary. St. Vincent's was in the old wooden building at the junction of Vernon and Winthrop Streets, and the Hahnemann in an old wooden building halfway up the hill on Providence Street. The Isolation Hospital was completed and occupied either the year I came here or the year following. None of these hospitals had laboratories as we regard laboratories today.

During this twenty-five-year period all these hospitals have expanded until now the City has a capacity of more than 300 beds, with more than 50 rooms for private patients. The Memorial has 150 or more with a still greater proportionate increase in private rooms. The St. Vincent's and Hahnemann occupy new buildings with their capacity doubled or trebled. The Isolation has been added to and now includes under its management the Putnam Ward for the care of the City's tubercular patients. Those hospitals that maintained out-patient departments have seen their work expand until new buildings have been occupied and new departments added, while the laboratory has become an indispensable part of the equipment.

In the smaller cities and towns in the district which this Society represents, hospitals have and still are being organized. As I have said this picture is only a regional one, and by the substitution of other names, could be applied

to any other region in the neighborhood of our large cities throughout the country.

It means that medical education has developed and become more thorough. The student is more carefully trained in history-taking and the use of apparatus in making a diagnosis. It also means that the confidence of the public in hospitals has grown so that now not only the poor, but those who have good, comfortable homes, often prefer to go to a hospital for treatment. Especially is this so in surgery, since it is rather unusual to hear of an operation being done in a private house.

The views held of certain diseases in my student days are well worth comparing with the views we take of those same diseases today.

It was only five years before my going to the medical school that Fitz had demonstrated to the world the rôle played by the appendix in peritoneal inflammations. The treatment of appendicitis was not then so thoroughly regarded as surgical as now. The medical side of a hospital rather enjoyed twitting the surgical side over the fact that it could show a lower mortality rate for this disease than the surgical. It hardly needs an explanation for this.

I well remember a certain day at the Massachusetts Hospital, where we were attending a clinic conducted by Dr. Warren, when an emergency case of appendicitis came in. Dr. Warren, thinking it a good opportunity to demonstrate the value of a consultation before us, called in Drs. Fitz, Shattuck, Eliot and Porter, each of whom gave his opinion of the case and his treatment of it. The consensus of opinion was that it was a favorable case for operation. Today there would be no discussion on that point. A majority of cases seen in the hospitals then were the advanced cases and it was comparatively rare to see a clean case operated upon.

But at that time there were men, among whom I especially recall Dr. Worcester of Waltham, who were urging operation as soon as the diagnosis had been made, and we know their position has prevailed until not only the profession but the general public is alive to the value of early operation in this disease.

The correctness of this position is shown in a comparison of the statistics of the mortality rate between the past and the present. Malaria was, or seemed to be, more prevalent then than now, and various ideas were advanced as to its etiology—the old miasma theory was hardly dead. Around Boston, residence along the banks of the Charles or the Mystic River, was supposed to render people more liable to it. The relation of the mosquito to the spread of the disease was demonstrated later.

There was much discussion in those days, and we were often called on to explain the difference between contagion and infection to inquisitive patients, and were sometimes hard put to give a satisfactory one. Diphtheria, scarlet fever and measles were given as types of con-

tagious diseases, while typhoid was the great example of an infectious one. The progress made in the handling of this last-named disease is one of the greatest achievements in modern medicine.

Many of those present can recall the cheering and admiration evoked when we stood on the sidewalks in 1898 and saw our four companies march off to the war with Spain. Fine, strong manhood they were! Some months later we all stood again ready to give them an enthusiastic welcome home. Did we cheer as that column passed through our lines? It was the most appalling sight I had ever seen in Worcester, and that line of emaciated, worn and unrecognizable men moved along more like a funeral procession, some of them too feeble even to sit up. Contrast that scene with the enthusiasm displayed as the columns of the 26th Division passed in review in Boston upon their return from France. Those men returned, many of them in better physical condition than when they went away, having been protected from the ravages of the disease that formerly carried off more victims than the enemy's bullets. When we consider what modern medical science has done to protect mankind against such diseases as typhoid, malaria, yellow fever and others; when we realize that compulsory vaccination has practically wiped out smallpox in the Philippines, and that it is some years since this country has been obliged to close its ports to travel from the West Indies on account of epidemics of yellow fever, is it not disgusting to receive (as many of us very recently did) postal in the name of the so-called "Medical Protective League," asking us to write our Senator and Representatives immediately, demanding that they vote against the bill to compel vaccination in private schools? We prefer to get our instructions from more reliable sources. While hygiene and sanitation have a great influence on controlling contagious diseases, it is hard to explain why these two should select certain diseases and practically stamp them out and leave others as prevalent as ever.

Antitoxin was just coming into universal use in the treatment of diphtheria, and statistics showed a remarkable drop in the mortality rate. Opposition to the use of antitoxin developed in the profession as well as outside, and one of the arguments against its use was that it increased the number of cases of neuritis following the attack. By saving so many more lives it would naturally seem to produce more complications until such times as the profession was awake to the value of the early use of the remedy. Now we hear no more about an increase in the number of cases of diphtheritic neuritis. Pneumonia, on the other hand, is a disease where no marked effect is seen in the mortality rate because we have no specific for its prevention or its cure.

The x-ray has been developed and its present value as a means of diagnosis has all been

reached in the past twenty-five years. I remember the first x-ray picture that I ever saw. It was that of a hand with some rings on the fingers, and the surgeon who showed it related to us how he had seen a silver coin inside a box by looking through a fluoroscope. Little did we realize how great an advance or help this one means of diagnosis was to become.

So, too, with many other methods, some of which we knew about, but which had not then been applied to a practical or universal use, such as the blood pressure apparatus, the electrocardiograph, photography, blood counting and blood chemistry. Radium had not been discovered.

One other thing I want to mention, because I believe it has come to stay, though our views may admit of considerable modification, and that is the theory that foci of disease hidden or untreated may be the cause, or one of the causes, of the rheumatic pains and arthritic changes so commonly seen and productive of so much deformity. If by attention to these foci and the intelligent treatment of them we can prevent the onset or progress of these joint changes no one thing in medicine will bring more relief to sufferers than this. How far we may go, or just where we may be led, may not wholly be apparent now, and we may decide that a chronic cholecystitis, for instance, is just as much a source of danger as abscesses at the roots of the teeth; still, I believe there is more than a possibility of great benefit coming from this theory. Attention to the upper right quadrant of the abdomen has decidedly increased, and it looks as though some men regarded the gall-bladder as about as useful to us as the appendix, and to be gotten rid of if possible.

Along with the expansion in hospital work, and with the changing views concerning disease and its treatment, other things have happened that have had a good effect. With the broadening of our ideas of disease and with the development of means of treatment other than by the use of drugs, the differences between the two most prominent schools of medicine have faded away and, today, we see our brethren of the homeopathic faith sitting with us with no thought on either side but that of good fellowship.

During the past ten years the College of Surgeons and the Association of American Physicians have been organized, both being in a position to exert great influence in shaping public opinion in the future.

The standardization-of-hospitals movement has brought about a more careful interest in hospital work, and has led up to the follow-up system and in many places to the engaging of a social worker. In this way a beginning has been made toward knowing the results of hospital work which will be of inestimable value in the future.

These changes, this expansion, the broadening

of the field of medicine have brought about a condition that causes us to consider where we are headed. Medicine has reached a stage where not only does the practitioner feel his helplessness in trying to grasp the whole, but even in the two great sub-divisions—medicine and surgery—there have appeared men who are being known as having given special attention to one set of organs, so that now we hear of the stomach specialist, the heart specialist, the specialist on respiratory diseases, etc. In this way, while the whole field of medicine has broadened, the individual's endeavor has narrowed. So far as the public is concerned, this attitude has been accepted as reasonable and no doubt beneficial. I think, so far as the patient is concerned, the sum total has been for his benefit and will be more so in the future. There are, however, some dangers and losses that I shall mention later.

We recognize that the great majority of cases seen in practice are cases which present either no difficulty in diagnosis, or the patient's condition is such that the general practitioner can handle them successfully himself. Then there are other cases where the diagnosis is so clear that the doctor consulted knows where to send them if he himself feels incompetent to care for them. There remain, however, many cases where the diagnosis is doubtful or obscure; where the services of a number of men in special lines are needed to clear up doubts before successful treatment can be instituted. It is to meet the need in these cases that the idea of group practice has sprung up, but not only on this account, but because it is recognized that to send a patient to a number of specialists for a collective opinion would be so expensive that it would be prohibitive to all except the rich. The idea is not to supplant the general practitioner, but to act as a consulting or advisory board for him. But could any group of physicians band themselves together, establish a laboratory and furnish all the other apparatus necessary fully to equip themselves for such work and make it a success in a district such as we live in? I think not, for two reasons: first, because a return from such an investment would not be adequate to give a good living unless the fees charged were so high as to prevent people seeking their advice and, second, because there would not be material enough to give that return. Even if one such group were successful their success would be a stimulus to other men to form another group, and a divided field would not be satisfactory for many reasons. Today there are men who undertake to establish themselves as such consultants and are successful because they act as a sort of directing head, referring the patient to this or that specialist as the case requires. Probably most of these men have access to some established laboratory or have made arrangements with a laboratory to do this work for them. This is very different from the arrangement I have just described,

where a set of men associate themselves together and furnish all the equipment themselves and expect to make it pay. I doubt then that the group idea will be a success, especially outside the large centers, except in the connection with some established hospital where there will be access to an equipment already there. And in this part of the country where there are comparatively few open hospitals, the opportunity for such grouping will be confined to those men who hold staff appointments. There are individual men who have established private hospitals and who have, perhaps, associated with them younger men who carry on investigations, and while I do not know the arrangement of such a group as to salaries, etc., I think the success of such an enterprise depends most frequently on the surgical fee or special fees and not upon the diagnostic work done.

I believe the group idea is a good one and will bring forth much benefit for the patient, but I believe its field will be limited to a comparatively few. Today, when we meet a doubtful or obscure case, we say to the patient, "Why don't you go up to the hospital for a study of your case?" And the patient, feeling that he is to derive much benefit from this very careful study of his case, falls in with the idea. He goes and is examined from top to toe, inside and out, and in instances receives decided benefit thereby. Are we not relying on the established hospitals and their equipment in order that the fees may be within the reach of our patients?

As it is, does not this thorough investigation include x-ray work, laboratory work which furnishes examinations of urine, faeces, blood and blood chemistry, kidney function tests, and perhaps electrocardiograms, as well as the services of a surgeon, a clinician or a neurologist, before the patient is turned over to the proper man for treatment or returned to his family physician? The work done may be paid for, but nowhere near the amount that would pay a decent interest on the investment. A collective opinion has been given, which is just as valuable, but is seldom paid for. If a surgical case, and the patient can afford it, the surgeon may get a fee for his operation. Otherwise, the patient goes to the ward and the operation is often done by the same surgeon for nothing. How many hospitals are there that are so well equipped with all the apparatus needed for this work that they do not have to go outside for opinions or work, that are successful financially unless they are endowed or supported by a municipality? This is as it should be, for medical endeavor has been and always should be towards benefit to humanity and never to the sordid view of a money-making scheme. Too frequently, however, we are imposed upon by the public. The public has been educated up to the paying of large fees for surgical operations, but it has not been educated up to paying for a diagnosis,

which is often just as important and may even be more essential to a successful handling of a case. They should be taught. Some form of group practice I believe will come, but I doubt that it will be carried to an extreme successfully.

Among other developments in the past twenty-five years having a direct effect upon the practice of medicine is the work done by the State or municipality. Great advancement has been made by the State through its Board of Health in the production of sera for the treatment of disease, the manufacture and free dispensing of antitoxin for the treatment of diphtheria, the more careful preparation of vaccine that reduces to a minimum the possibility of contamination with foreign material, the establishment of laboratories for investigation—physiological and pathological—and for experimental research. The State has also been divided into districts with a health officer in each, whose business it is to look after the conditions under which men and women work. Nearly all the larger communities maintain laboratories where sputum, urine, faeces can be examined; where Wassermanns can be tested out, and where cultures can be examined and reported upon. Municipalities, also, under the direction of their Boards of Health, have established school inspection and have carried it so far that now, not only is search made for contagious disease, but the eyes, nose and throat are examined for defects, or any malformation or beginning trouble detected and the attention of the parents called to the condition.

The attitude of the public to all this has been too frequently that of suspicion or of looking upon it as meddling, but when the benefit of it all is seen, both from the pecuniary gain and from the betterment of health, much of this opposition has disappeared.

Large manufacturing establishments, upon investigation of the time lost by their employees through sickness or accident, have established hospitals of their own where first aid can be given or beginning sickness detected, thereby saving many hours of lost labor. The results obtained in these large plants have brought about the law requiring plants that employ 100 or more hands to provide some one trained in first aid to give aid to injured persons.

During this same period the Workman's Compensation Act has come into existence. Under this Act the manufacturer is enabled to throw the burden of the case of his injured on other shoulders and devote the time saved thereby to other matters, and the workman receives great benefit in the assurance that there will be something coming to him if he is injured, and that there is not the necessity of going to a court to get justice with the chance of getting nothing. There are many defects in this law and too often a great chance for unjust claims to get in for consideration, but on the whole I think the law has benefited both parties. What about

the doctor? I think the Act has made no great difference with the amount of work the average physician gets. I recall the preparation I made to meet the great stream of accident cases I expected to get on the first Fourth of July after I started to practice, all of which I did not get, and I learned that the vast majority of accidents go to hospitals anyway, and now I get out of town on that day if I can. Did the average physician, who before this Act was not in the employ of some establishment, see any more of accidents than he does now? If he did, I think the difference was slight. When the Act first came into effect many doctors took advantage of it to run up exorbitant bills against the insurance companies, and the companies retaliated by fixing things so that the work should not be paid for unless taken in charge by men of their own selection. This ruling has been changed so that now the injured man has the right of choice as to who is to take care of him. The insurance company is protected by the ruling of the Commission that it should be charged just what the man would be charged if he were to pay the bill. I believe the average physician is not affected much by this Act. On the other hand, I believe the surgeon connected with hospitals is the one who is unjustly called upon to give of his time and effort in the care of these cases without compensation, except as he may be in the employ of some large plant. Some boards of trustees of hospitals, having recognized this, allow the staffs of their hospitals to charge for their services, but the Industrial Accident Board has ruled against this. I believe this is absolutely wrong and that no insurance company should expect to get any work done for nothing.

In 1915 the Legislature of Massachusetts appointed a recess committee to study into a proposal to create old-age pensions and insurance against sickness. This committee held fourteen meetings in various parts of the State, and in 1917 presented its report to the Legislature. There was a difference of opinion amongst the individual members of the committee with regard to the exact framing of the law, the time when such a law should be enacted, and the manner of assessment to establish a fund to meet the expense, but the majority opinion was in favor of ultimately enacting such a law. Other States, notably, New York, Pennsylvania, Ohio and California, have had committees studying this same proposition, but up to this year, so far as I know, no State has adopted the plan. The difference between this plan and the Workman's Compensation Act is that it is proposed to raise the money to meet the expense by assessment on those entering into the plan or on the whole body politic. As to the cost of actually carrying on this work, it is argued that the burden would not be much greater than the community now has to stand. When we consider the number of organizations and societies now

in existence that are directly or indirectly concerned in the care of sick and unfortunate members of society, and the amount of money that is contributed by individuals or firms for the same purposes, perhaps we shall find that it is not a greater burden for the State to take it over and systematize it, but past experience in State management does not give us such a lot of confidence that this plan will do away with the need of the same societies, or the contributions from private sources. After having given this subject a somewhat superficial study, I am of the opinion that some sort of health insurance is liable to be thrust upon us in the future, but whether or not it will be a bad thing for the profession depends largely on the alertness with which we look after our own interests. My purpose is not to take up the pros and cons of this subject, but to consider it only in its effect on the progress of medicine.

One other matter: In the October number of the *Century* magazine, is an article entitled, "Trailing the Robin Hoods in Medicine." As I understand it, the historic Robin Hood was an outlaw and after reading the article one does not wholly grasp the reason for this title. The writer begins by calling attention to the fact that the trustees of Johns Hopkins Hospital have made a rule that the maximum fee charged for a surgical operation should be \$1000. He goes on to discuss the question whether surgeons are profiteers or not, and concludes they are not, that no class of professional men do their work more considerately or conscientiously. He claims that the important point is not the large fees charged rich people, but the general high cost of medical attention. He then suggests that the question of medical attention be discussed in terms of the nation and not in terms of the individual. He prophesies that some day we will zone the country for medical purposes, as it is now zoned for banking purposes. We will do away with private practice and create a health army of doctors adequately supplying each district with sufficient practitioners and specialists so that every inhabitant in the district can have all the attention needed. This health army will be salaried and therefore not in danger of treating one more carefully than another. He considers that the present system puts a premium on disease rather than health. The number and quality of men who serve, the length of time required for preparation, the physical equipment of laboratories would then be determined by the health needs and not on what an institution needs and can pay for. This system, he contends, would relieve the doctor of depending on sickness as a source of income and allow him to turn his attention to the prevention of disease. This system would result in the family sending for the doctor at the first indications of sickness, and enable him to give early attention and call as often as he thought necessary with-

out being accused of fee hunting, and would mean a larger average income for the profession with less expense to the community.

In the foregoing pages, I have tried to place before you some of the influences that have appeared in the last twenty-five years that are having a decided effect on the progress of medicine. I do not claim to have touched upon all, but have selected those that illustrate to my way of thinking the most important, and these immediately divide themselves into two distinct factors, *i.e.*, those coming from within the profession and those from without. Taking the latter first, we are again able to make a subdivision into those coming from the State and those from the general public.

So far as the State is concerned I believe that where medical matters have been left to the appointed health boards and their work has been unhampered by political influences, there has been a continued progress. The successful building of the Panama Canal, or its completion without an appalling loss of life, depended on the application of the principle of the way in which malaria, yellow fever and typhoid were transmitted. This same principle has been applied successfully to the stamping out of typhus. Hygiene and sanitation were not enough to render Panama safe for work. It needed the study of the habits and habitat of the mosquito and protection against that insect. Neither were hygiene and sanitation enough to stamp out typhus. It needed sterilization also.

I have already mentioned the work of the State in furnishing sera, toxins and antitoxins as well as in establishing laboratories for physiological experimentation and pathological investigation. All these things are in the line of advancement and of immense value to the general practitioner and of great benefit to the patient.

Perhaps the greatest effort of the State health organization has been towards prevention of disease, and in its various departments this work is well done, but its results are, too often, not seen or understood by the public and criticism or open opposition, malicious or otherwise, frequently results. An illustration of this is the present attempt of the State Board of Health to introduce the Schick Test into the schools. Fear and prejudice towards such a thing is but natural and should be recognized and a wise attempt made to overcome it or it will fall prey to some one who has an axe to grind or one who is looking for cheap publicity.

When we come to consider the influence that the general public is having or will have upon the progress of medicine, we look back over the past with no great degree of confidence that our aims and motives will be understood. It is not much over twenty-five years ago that anyone who wanted to practice medicine in Massachusetts could hang out his sign and that was all that was required. When a bill regulating the practice of medicine was presented to the Legis-

lature, one of the most prominent Harvard professors appeared against it on the ground that it was infringing on the personal liberty of the individual's right of choice of his physician. The fight between vaccinationists and anti-vaccinationists has existed for years and still exists; so also, with the anti-vivisectionists. Occasionally a new organization like this Medical Protective League is formed with a definite purpose of fighting some progressive medical idea that has undoubtedly passed the experimental stage. Then there are the "real good" people who see only that a measure seems to benefit mankind without giving a single thought of possible detriment to the very object they are desirous of attaining. But, after all, does not this opposition come from a very small minority of the whole, and does not the vast majority of people still have confidence in the medical profession, and are they not willing to be led and to see the value of a new step as soon as they are shown?

As evidence of this, note the gradual acceptance of the practice of inoculation against typhoid, furunculosis, asthma and other diseases, until, I often think, the public has more faith in some of these inoculation theories than the doctors themselves. Acceptance of our ideas or advice may have come slowly and may have produced active opposition, but as a rule we have not failed to gain the confidence of the public and its co-operation. This attitude should be met, as I believe it is being met, with a straight-forward, honest and entirely without subterfuge attitude on our part. More and more the public has been taken into our confidence and our aims laid squarely before them. So when we are confronted with a proposition like national or State health insurance, where our interests are affected we should look upon it from the broad view of citizens just as much as doctors. There seem to be varying views in England, where it has been tried, as to its effect upon the profession, which is the side of it that I am mainly concerned with now, but if I read correctly there is a strong feeling that the whole body politic is better off with law in effect. What I am concerned in at present is the question whether or not it will be a hindrance to progress in medicine. One thing is certain, that if the public is satisfied that national health insurance is for their benefit, or even this fantastic scheme of zoning the country and making health officers of us all—(I brought this scheme in just to show you that such things were being thought of)—if, I say, the public is satisfied that these schemes are for their benefit, they are not going to stop because we do not like them. It is for us to point out to them that anything that tends to lower the standard of efficiency of the doctor is not for their benefit. That is one side that does not always enter into the view of well-intentioned people.

Are there not many drawbacks to such schemes as these, when we look at them from that angle? Under the present system is there a premium placed on sickness? We all know how, as young physicians, struggling to get a start, we have put our best into the care of our patients, because we knew our success and reputation depended upon doing so. Would this be so under any of these schemes? On the other hand there would not be the same reason for a student to so thoroughly equip himself, if he had to feel that after he began practice he would be limited in his ambitions. Would there not be a temptation, as long as the community or State was paying the bill, to make as many visits as possible and run up as big a bill as possible? The patient, no doubt, would not care, for he would be paying just as much whether sick or not, but would he have the same respect for the physician as a man that he has now? If we were all health officers, would there not be a great chance for graft in accepting from the well-to-do extra fees for extra attention? I am not maligning the profession by pointing out that there might be men in it that would stoop to such practices, but I am trying to point out the temptations that would beset him. If we were salaried health officers and conscientiously felt it our duty to watch a case of pneumonia by making three or four visits a day, would we not be in hot water all the time trying to explain to some neurasthenic why so many visits on her were not necessary?

If there is a premium on sickness under our present system, would there not be a much greater one under any such scheme?

Would there be the same incentive for the individual doctor to keep abreast of the times, to constantly study and keep in touch with the best thought of his profession as there is now when his success depends so much on that one thing? It reminds me of the statement of one of our citizens, who had served as an alderman, in describing how a committee from that body went on an inspection tour of our sewerage system. Some of the committee did not get out of the automobiles until they landed at the State Mutual Building, where they were to have dinner!

Our friend of the "Robin Hood" article says that under the existing system of private practice, we have no assurance that every doctor will spend as much time as he should in preparation for practice and no assurance that he will keep constantly in touch with the latest results of research, etc. He also claims, in speaking of medical schools, that in the present system the number and quality of men who serve on medical faculties, and the physical equipment of laboratories, are to a greater or less extent determined by what the institution can pay for, and not by its needs. Do you think that any institution controlled by the Government, with all the chance there is for political intrigue, would select its teachers with any

greater interest for the institution's welfare than is done now? In what field has governmental control demonstrated that it has produced better conditions than exist under private management? Who is responsible for our present laws governing registration in medicine? Are they what we would make for ourselves if we had the whole say?

No law requiring a doctor to take time to study, to visit hospitals, and to take post-graduate courses, would be half so effective in stimulating him to do so, as for him to realize that it was for his own interest to do it.

In the past, the profession has set a standard for itself. It has never tried to restrict the freedom of choice to the individual in selecting a doctor, but it has insisted that, if a man desired to become a doctor, he should go through a preliminary training and not impose himself upon an unsuspecting public. In so far as this requirement fails to meet our ideal, the fault does not lie so much with the profession as with outside influences. In other words, we set a much higher standard than the public would require of us.

Courses in schools have been extended, a better preliminary education insisted upon, clinical teaching and hospital experience have been developed so that now medical schools outside the large cities, where there is an abundance of clinical material, are hard put to exist at all.

Through the efforts of men in the profession, and later through the influence of the College of Surgeons, there has been set up a standard for hospitals, and hospitals refusing to attain or to approach that standard are liable to be advertised for their true worth before the public.

Would there be any better progress if these things were controlled by regulations or laws? If national health insurance comes, it is up to us to help frame the law so that there will never be a breath of suspicion that we can take advantage of it to milk the public fund for all we can get out of it. Let us not make the mistake of viewing any such legislation as apparently some doctors in the beginning viewed the Workman's Compensation Act.

In the days past, the doctor was an individual set aside for a special duty. He was excused from jury duty, he kept by himself and assumed that it was beyond the understanding of the laity to attempt an explanation of medical matters. Today this is all changed and we must assume more than ever the work of taking the public into our confidence. We must become teachers and leaders and it is my conviction that such a course will result in a better understanding of our ideals, and we will not find it more difficult to influence public opinion than formerly. Any attempt to establish health insurance must be met by us in a broad-minded manner and not from a selfish view.

Lastly: what is the effect upon the individual doctor of all this modern medicine? Will ne

be as self-reliant and versatile as formerly? Is there not danger that he will become too dependent upon the apparatus side of it all, and less upon his own individual effort? I heard Dr. W. J. Mayo say once, in speaking of the modern methods of diagnosis, that after all they were only adjuncts to confirm what we could see, feel or hear. He said that a careful history, plus what we could feel with our hands, was of inestimable value because of its effect in keeping us alert. I believe no truer thing has been said. I heard one of our own number say once that we should always endeavor to diagnose a fracture and use the x-ray only as confirmatory evidence.

As I have said before, the student comes forth much better equipped than he was twenty-five years ago, but he has to acquire judgment and discrimination, and these qualities he will acquire by his own efforts better if he aims to do his work alone, learning to select those cases that require more than the ordinary investigation. He will be better appreciated by his patients, he will have shown a deeper interest in his work, and that quality of sympathy so essential to command the confidence and devotion of his patients will not be lost.

I remember, when a boy of twelve or fourteen, our old family physician died of diphtheria. Owing to the malady a public funeral could not be held. I remember the consternation and gloom that settled over the community when it was realized that the doctor was dead. I remember the service some time later in his memory, when the whole township, regardless of religious creed or station in life, assembled in the largest church in town to honor him. Later the people placed a monument over his grave in commemoration of his long years of devotion to them. Dr. Gage told me that his father regarded Dr. Warner of Leicester as one of the best men in this vicinity.

Not so long ago this same feeling was shown when the late Dr. Charles H. Perry died. We remember how his house would not begin to hold the crowds that wanted to attend his funeral. Neither of these two men would be regarded as particularly scientific, perhaps, but they filled a place where they lived, along with a number of others who have passed away, that would be hard to duplicate today. They were self-reliant and versatile. They strove to get into the lives of their patients in a way that scientific medicine never has or never will teach us to do.

Pardon me for citing a case in my own practice, and please do not think I am trying to build a halo around my head for anything I have done. The excuse for bringing this case in, is that it is no more than occurs in the practice of any one of us. I was called upon last July to attend a young girl. I do not intend to go into her case except to say that for three months it was a hard fight, and when a lump condition appeared on top of an abdominal one

I went home one night feeling like a "licked pup." That thin, pale face haunted me day and night. It used to cut deep into the heart to see the appealing look mingled with fear when I did her dressing because she thought she was to be hurt. During it all she never lost confidence and faith that she would get well, and she did. Today as I contrast that pale, thin, appealing face with the full, rosy-cheeked, almost mischievous one, and the figure that indicates that health has been restored again, I know that I was stimulated to do my best by the trust placed in me.

If scientific medicine ever brings about a condition where true human sympathy is lost, where the regard of the patient for the doctor gives way, or where the close relationship just as often established through working on a hopeless case as on a successful one is not present, then we as a profession will have lost one of the charms that make our work worth while. If what I have just said is regarded as sentimental, and therefore to be scouted at or disregarded, then I am sorry for the fellow who cannot or will not be sentimental. He is the loser.

You all remember the incident in Ian McLaren's story, "The Doctor," where the country practitioner had called a great London surgeon to save the life of one of his patients. The surgeon was met at the station and taken in the "one-horse shay" to the patient. The route necessitated their crossing a swollen stream that meant danger to them both. The great surgeon hesitated and then refused to cross. Do you recall the contempt shown by the less scientific man for the other, and the personality that compelled the great man to do his duty? After the operation was done the surgeon took off his hat to the other, gave him all the credit for saving the life, and said he was proud to do homage to the man who, in the face of danger, had compelled him to do his duty. The opportunity to make true men of ourselves is there, and we should never lose sight of it.

To recapitulate: We see two forces at work today affecting us, one from within, and one from without. These two can be at variance, but they do not need to be. Much depends on our own attitude.

We as a profession must come forward and assume the position of leaders and teachers. We must develop as a body that same confidence in our motives that the individual doctor now often holds in the hearts of his patients. If scientific medicine ever leads us to a point where the finer instincts of our lives are blunted, if we look upon our patients as machines to be taken to pieces and put together again as we will, if it ever leads us to a point where we are out of touch with the sympathy and devotion to ideals higher than science, then we will be the losers.

Preventive medicine has come to the front, and the old saying that we are a profession that

is constantly trying to put ourselves out of business may seem to be true, but it is not wholly true; for, with new fields of investigation opened up, new opportunities have come, and there is work for all. The field has not narrowed but broadened. Our work has changed and become more collective or interdependent, and much less individual. It is not necessary that this new view, this interdependence, should lower our standards or do away with the best of the traditions of an honorable profession. It is because I feel that there is a danger in it that I have written these pages. We can conduct ourselves as a body so that we shall still maintain that confidence from the public that the old practitioner enjoyed, and if we do this we shall have become better men and better citizens for the effort. In this new interdependence are we not liable to discover each other's mistakes more than ever, and does it not behoove us to be more charitable towards each other than ever, and never stoop to the position of trying to "get something" on somebody?

STATISTICS TAKEN FROM THE REPORTS OF FOUR HOSPITALS: MASSACHUSETTS GENERAL AND BOSTON CITY IN BOSTON, MEMORIAL AND WORCESTER CITY IN WORCESTER.

Note that where there has been a discovery of the mode of transmission, or a successful method of inoculation, there has been a marked decrease in the number of cases, with no great decrease in the death rate.

	1895.		
	Cases	Deaths	
Typhoid	461	68	15%
Malaria	105	1	
	1920		
	Cases	Deaths	
Typhoid	105	10	10%
Malaria	15	0	

In diphtheria, on the other hand, where there is no specific for prevention, the number of cases has not diminished, but the death rate has been greatly reduced, because we have an antitoxin for treatment.

	1895.		
	Cases	Deaths	
Cases in Worcester	736		Death rate 27.5%
	1920.		
Cases in Worcester	908		Death rate 6.25%

In pneumonia, where we have no specific for prevention or cure, there has been no decrease in either the number of cases or in the death rate of any account.

	1895.		
	Cases	Deaths	
	459	162	35%
	1920.		
	Cases	Deaths	
	705	250	28%

In appendicitis the treatment has become entirely surgical, and the practice of early operation has resulted in a marked drop in the death rate.

Cases	Deaths	
414	30	8%
Cases	Deaths	
1586	33	2%

These statistics have been collected rather hurriedly, and may not be correct, but they illustrate the facts presented.

BACKACHE.

BY WILLIAM DAMESHEK, BOSTON.

DR. OLIVER WENDELL HOLMES defined woman as "a constipated biped with a pain in the back." He must have been exaggerating, but the definition serves to bring to mind a symptom which, with constipation, easily holds first rank both in incidence and troublesomeness with the other ills of mankind.

Thanks mainly to the valuable educational articles written by the manufacturers of Doan's Kidney Pills ("Every Picture Tells A Story"), and by other equally public-spirited manufacturers, the laity has come to believe that pain in the back means "kidney trouble." This is by no means a laughable conclusion when one considers the names that the erudite and scientific medical profession has foisted on this symptom-group: neurasthenic, hysterical, irritable, railway spine; chronic lumbago, uterine backache, static backache; relaxation, subluxation of the sacro-iliac joint; sacro-iliac strain; rheumatism, arthritis of the spine; chronic back-strain, etc., *ad infinitum*.¹

All of this means that pain in the back may be due to anything from psychoneurosis to spinal caries. Every patient with an infectious disease, every case of childbirth, every tired medical student, weary from hours of sitting in hard lecture-room chairs and nights of study, has pain in the back. These are the most common causes of backache, but there are also the *kidney* group of cases; and the *pressure* group, referring to diseases which involve a progressive compression of the lumbar cord or its nerves: aneurysm, neoplasm, tuberculous spine; not to mention the pain referred from various other abdominal organs, and from the organs of the chest. In a differential diagnosis, to be complete, one would start with the skin (herpes zoster) and successively take up muscles, joints, bones, and organs.

The above causes are relatively easy of diagnosis, and are brought out by a carefully taken history and physical examination, com-

bined with laboratory findings. There is a great group of cases, however, which has thus far not been mentioned—namely, the undiagnosed chronic backaches which pass from clinic to clinic labelled in various fashions, treated in various other fashions, and cordially hated by students, internes, and visiting physicians because there are other and greater things to be done.

SYMPTOMS.

The general symptoms of this group can be brought out no better than by a typical or composite case, such as the following:

Case.—A Jewish housewife of 43 years, married, comes to the O. D. D. of the Peter Bent Brigham Hospital, complaining of backache, duration 8 years.

F. H. Negative.

M. H. Husband living and well, 9 pregnancies, 2 miscarriages; 7 children, all living and well.

P. H. Essentially negative.

P. I. For eight years, patient has been troubled with weakness, "nervousness," and general pains and aches, especially severe in the back.

Cardio-respiratory. Dyspnea on exertion, palpitation, no cough, no oedema of the ankles.

Gastro-intestinal. Appetite poor, tongue coated, bowels regular but must use pills daily to make them move. No nausea, vomiting, or distress.

Genito-Urinary. Urinates D 5-6/N 0-1. No dysuria or other urinary abnormalities.

Catamenia. Onset 13 years; regular; lasts 3 days; patient must stay in bed for two days with headache and malaise. No menstrual abnormalities noticed. Last period one week ago.

Neuro-muscular. Headache, frontal or occipital, associated with much work and worry. Worries a great deal, especially in regard to her husband, who is very nervous, who always grumbles, and who is never satisfied. Her husband is very passionate, but she tries to avoid his advances because she is so "weak."

Locally. She has had for eight years a dull, dragging pain in the small of her back, worse on standing or walking; occasionally the pain is sharp; there is no relief by any measures the patient may take.

P. E. Negative, except: Abdomen—greatly relaxed and pendulous; Pelvic—lacerated cervix; 2nd degree retroversion; somewhat relaxed pelvic floor. Local—slight limitation of forward and side bending, associated with some pain. There is tenderness on pressure over the lower lumbar region.

On analysis of this case, it will be seen that it has many aspects. Not only is there an *orthopedic* element,—the back symptoms,—but there is a *gynecological* element—the lacerated cervix, etc.; a *medical* element—the constipation; and a *psychiatric* element—the headaches, worries, etc. Were this patient to fall into the hands of a gynecologist, he would repair her

pelvic floor; an orthopedist would give her a corset; a medical man would tell her not to worry and treat her constipation; while a psychiatrist would treat her complexes and laugh at corsets. There is no use in dividing these cases arbitrarily into those due to pelvic manifestations, etc., since in most cases most of the elements will be found mixed.

THEORIES.

Merely for convenience, however, especially in picking out the various theories that have been advanced as explaining indefinite chronic backaches, we may divide them into these classes: Backache, due (1) to traumatism; (2) to arthritis of the spine; (3) to disturbances of pelvic organs; (4) to so-called "relaxation" or "subluxation" of the sacro-iliac joints; (5) to so-called "relaxation" or "subluxation" of the sacro-lumbar joints—spondylolisthesis; (6) to static causes; (7) to neurasthenia.

Backache due to traumatism and to arthritis of the spine can be dismissed briefly. These causes are more or less definite, cause chronic backache, and are treated in various well-known fashions. Arthritis is shown by x-ray, is frequent, but the symptom backache is usually out of all proportion to the amount of arthritis.

Few writers, notable among them Dr. R. C. Cabot,² doubt that disturbances of pelvic organs cause, in some way unknown to them, backache. An interesting explanation of the method by which pain is caused in these cases is given by Reynolds and Lovett³ who, in a joint gynecologic and orthopedic paper, conclude that tenderness of intra-abdominal or intrapelvic organs usually induces the patient to assume a stooping or other strained position in order to relieve the tenderness. This causes pain, by the mechanism later to be discussed.

The theory which has aroused most controversy, and which has been most productive of varied effects, is that of "relaxation" of the joints in the region of the small of the back. Relaxation of the sacro-iliac joints in association with pregnancy has long been discussed and, as early as 1870, was given as the cause of "distressing symptoms" in that period.⁴ This has been called "physiological,"⁵ and has even been stated to be the cause of backache during menstruation, which has been likened to a "miniature pregnancy."⁶ Not until 1905, however, was relaxation or subluxation of joints made to explain backache in general. Goldthwait and Osgood⁷ asserted that subluxation of the bones forming the sacro-iliac joints was the cause of many of the chronic backaches. They give as symptoms—guarded motions due to involuntary spasm; peculiar attitude on standing; limitation of motion, both forward and side; and abnormal mobility of the sacrum. The peculiar attitude of standing in these chronic cases, and the pain caused on motion, they attribute to the

abnormal position of the bones forming the sacro-iliac joints, causing thus an abnormal tilt of the spine on the pelvis, and pressure on the nearby nerves.

A host of writers thereupon took up Goldthwait's theory, which he further elaborated in 1907,⁸ so that the literature during the next decade is flooded with this newer pathology, and "subluxation," "relaxation," "slipping of the bones," have become almost by-words in certain medical circles.

It is noteworthy that none of these authors give x-ray evidence to support the pathology, although it is self-evident, as Lovett says,⁷ that a displacement of the joint severe enough to press on the nerve-trunks must surely be shown by x-ray. Some of the writers are quite frank in saying that the x-ray is negative in these cases although their diagnosis is relaxation.⁹ Furthermore, autopsy and dissecting-room records fail to bring to light such pathology.

Not alone were the sacro-iliac joints implicated, but it remained for Goldthwait in 1911,⁹ and again in 1913,¹⁰ to bring the sacro-lumbar joint into the limelight. Goldthwait stated that, due to relaxation of the lumbosacral ligaments, the fifth lumbar vertebra could easily slide forward upon the sacrum and be dislocated—spondylolisthesis. The dislocation could take place also to one side with the result that the whole spine would be rotated, the articular process of the fifth lumbar would be drawn into the spinal canal, causing irritation of the nerves inside or outside of the canal and producing thus leg pain called sciatica. It became quite the fad in the last decade to diagnose spondylolisthesis for chronic backache, and even now, in rare instances, the diagnosis is possible if x-ray shows the lesion.

My reason for laying so much stress on this subject is that the osteopaths and chiropractors have taken up the theory of subluxation and nerve pressure and have based all their scientific structure on this—to say the least—dubious pathology.

In 1910, Reynolds and Lovett,³ after three and a half years of research, propounded the so-called static theory. They explain backache by saying it is due to a forward displacement of the center of gravity of the body. This results in an undue strain on the posterior muscles and ligaments, causing pain. *A priori*, the attitude or slouch bringing this about would occur in persons of diminished resistance, of peculiar figures—and it does. As an analogue of the process, we have the familiar pain caused by flat-foot. The sacro-iliac joints may also be involved in posterior strain, causing irritation, and thus pain in the sacro-iliac region. This may rightly be called sacro-iliac strain, but, according to Lovett, it is wrong to assume that this is an entity. All the symptoms referable to the sacro-iliac joints are explained by a *general* attitudinal strain.

Lovett's theory explains most cases, but I cannot see how it explains those chronic cases with definitely limited motions, peculiar attitudes of standing, etc. Here Goldthwait's theory would be useful, if it were acceptable. We will grant the fact that there is normally *some* motion—3mm.—at the sacro-iliac joints (Goldthwait). Is it not possible that wrong methods of standing and walking, repeated small injuries to the joint surfaces, produce a chronic synovitis of the sacro-iliac joints with resulting pain and limitation of motion, as in the synovitis of other joints? Is it not further possible that in the process of healing of this chronic synovitis, adhesions between the sacrum and ilia are formed, thus producing severe pain on motion, extreme limitation of motion, with peculiar attitudes of standing, and *with no pathology demonstrable by x-ray?* And again, is it not possible that the "snap," "crack," "slip," etc.—*i.e.*, the sound which osteopaths produce on manipulation of most of their patients with chronic backache—is it not possible that this is due to breaking of the adhesions, and that the accompanying relief is due to the fact that the adhesions are broken, and normal motion is again possible?

Thus far I have refrained from mentioning, as a cause of backache, psychoneuroses. I believe that psychoneuroses can cause backache, but only in a roundabout fashion. Psychoneurotics usually have flabby minds, leading to flabby muscles and ligaments, to postural defects, and thus to strain and pain. There is probably always an organic cause, and there is probably always real pain; but, as with everything relating to himself, the psychoneurotic magnifies his pains and aches until they are out of all proportion to his pathology.

Finally, we should consider backache in its relation to other indefinite disorders, also difficult, also shunned by most medical men: namely, constipation and visceroptosis *et al.* There is no doubt that these two are sisters in evil with backache and that the one is inseparable from the others. This assumes importance in the treatment of any of the three—that is, measures must be directed at, not only one, but at all the others.

DIAGNOSIS.

The diagnosis of the type of backache I have been discussing is made partly on the history and partly by exclusion. X-rays should be taken in all cases to rule out hypertrophic arthritis. In women, a pelvic examination should always be made, but conclusions from this should not be too hasty. The individual's attitude, both of body and of mind, is a great factor in the consideration.

COMPLICATIONS.

The complications of backache are three: invalidism, osteopathy, and chiropractic. The so-called healing cults have sprung up as the results of the physician's inability to cope with

such a simple symptom, whereas syphilis and tuberculosis afforded much more opportunity of cure. After all, a patient worries about a *symptom* and wants it removed as speedily as possible; therefore, one cannot blame him for seeking the advice of a man who has helped his friends in numerous cases. In a recent article in the JOURNAL,¹¹ Dr. Macatee states that society has in many of its units found the medical profession wanting; the popularity of the cults represents the individual experiments of these units in their search of the good.

TREATMENT.

I suppose I will be accused of treading where even angels fear to tread when I talk of treatment of this difficult condition. However, is it not a possibility that the orthopedist treats his cases by corsets and forgets medical and psychiatric treatment; that the gynecologist puts the uterus back in place and neglects other measures; and that the psychiatrist treats the complexes and would not think of applying a brace for an "hysterical manifestation"? A medical student is supposed to have an extensive knowledge of practically all of medicine,—a bird's-eye-view, in fact,—and perhaps this helps him to evaluate certain data, certain modes of treatment.

With these somewhat apologetic remarks, I will proceed to the treatment. First, a few general statements: The treatment must be absolutely detailed; it must, furthermore, be sympathetic—if the physician *knows* he is going to help the patient, half the battle is won.

As general treatment, plenty of fresh air, good food, and measures to correct constipation and visceroptosis should be considered. Constipation can be treated by various well-known methods, while visceroptosis is treated by exercise, proper methods of standing and walking, braces, etc.

If it is felt that there is a psychoneurotic element in the symptoms, the causes of the neurosis should be thoroughly gone into, and the underlying factors pointed out to the patient, with possible remedies. Merely telling a patient not to worry is probably a useless procedure, whereas explaining to an individual *why* he worries is often of help.

I will not enter into the question of when and when not to use gynecologic methods; firstly, because the subject is so unsettled, and secondly because my knowledge is so meagre. I will merely interpolate a warning given by Chalfant at the St. Louis meeting (1922) of the American Medical Association, which is relevant to the subject.¹²

"The idea that a 'displacement of the womb' is an exceedingly serious condition and may cause symptoms of any kind seems to be firmly established in the minds of people at large. Almost any woman who is not in good health from any cause can be persuaded to submit to opera-

tion when such a diagnosis is made. . . . Too often she is not relieved of her backache until she is fitted with proper support for her sacro-iliac joints; or of her headache, until fitted with glasses, or even of her constipation until her diet is corrected. *These things could be done before resorting to operation just as well as after it* [italics mine], and the patient saved the danger, suffering, and expense of a needless laparotomy. It would seem that at times the benefit derived from this operation is largely due to the enforced rest incident thereto."

As for local measures, a belt or brace has long been known to help. Italian laborers instinctively lower their belts to the level of their anterior superior spines to prevent back strain. Except in the very slight cases, however, mere belts or adhesive strapping are probably of no avail, because they must work through so much muscle and bone. Lovett² advises a corset which is tightest around the bottom, and which furnishes both abdominal and sacral support. The corset should be straight in front and should support the hollow of the back. In addition to the corset, Lovett advises a course of rest in bed for the first few days, and, after the irritation has quieted down for some time, exercises and massage.

An interesting method of local treatment has recently been brought forward, namely, deep normal saline solution injection intra-muscularly, or sacral epidural injection of the same. A description of the latter procedure is given by Ayer in Cabot's "Case Histories."¹³ This method is so new that at present nothing conclusive can be said about it.

Osteopaths treat their cases differently and presumably with relief to many, according to the report of the Committee to Investigate Medical Cults,¹⁴ although the cause of the relief is not known. If my remarks to the effect of adhesions are true, the only rational treatment, then, for chronic cases, with severe pain and extreme limitation of motion, is *manipulation*, and by osteopathic methods. First, there should be a general loosening up of the muscles by swaying the body from side to side, then a quick thrust to the side, followed by a loud "click" or "snap"—the sound, presumably, of breaking adhesions. There is a knack to this manipulatory treatment which very few medical men possess, and if this is valuable, there is no reason why, in this instance, the medical man should not take a leaf out of the osteopath's notebook and treat accordingly.

It will be seen at once that a method of treatment which considers such matters as diet, underlying complexes, methods of standing and walking, manipulations, etc., is a very unwieldy, if not impossible one to handle in a busy out-patient clinic. If such is the case, is it not the fault of the out-patient clinic that such patients are not treated properly, rather than the fault of the treatment? If there are cardiac classes,

diabetic classes, etc., there could profitably be backache classes, where large groups could be simultaneously instructed in fundamental principles.

SUMMARY AND CONCLUSIONS.

In conclusion, I wish to emphasize several points:

1. Backache is probably the most common symptom presented for diagnosis and treatment.
2. The cause of chronic backache (aside from hypertrophic arthritis) is unknown, although it probably is postural in origin.
3. Subluxation or relaxation of the sacro-iliac joints is an explanation not supported by facts, and is probably of extremely rare occurrence.
4. The cause of chronic backache with limitation of motion, peculiar attitudes of standing, and severe pain may be due to a chronic synovitis with the formation of adhesions between the sacrum and ilia. Rational treatment is, therefore, the breaking of these adhesions.
5. Backache is almost invariably associated with other indefinite disorders, such as constipation, visceroptosis, and neurasthenia, and the treatment should include all of these.
6. Backache is slighted and improperly treated by the great majority of physicians and clinics, resulting (a) In great economic loss to the patient (1) who goes from doctor to doctor, (2) who is prevented from doing efficient work, (3) who may become a chronic invalid; (b) in loss of prestige of the physician; (c) in the popularity of the healing cults.
7. Most cases of chronic backache could be properly treated, with good chance of cure, if enough time and thought were given them.
8. The treatment should be detailed and sympathetic. It is (a) *General*—In which measures against constipation, visceroptosis, underlying complexes, wrong methods of standing or walking, gynecology, are considered; (b) *Local*—(1) For mild cases, a belt or adhesive strapping; (2) for more severe cases, a course of rest, and then a tight corset, as suggested by Dr. Lovett; (3) for severe cases, the breaking of adhesions by manipulation—the osteopathic method.
9. Backache could be advantageously treated in classes at the hospital.

I wish to express my gratitude to my instructors, Drs. Elliott C. Cutler and Hilbert F. Day, for their inspiration and aid.

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REPORT OF A CASE OF BILHARZIASIS FROM UNITED STATES MARINE HOSPITAL NO. 2, CHELSEA, MASSACHUSETTS.*

BY WENDELL P. CLARE, M.D., CHELSEA, MASS.

THE following report of a case of bilharziasis is submitted with the hope that it may prove of interest to other members of the profession, especially those who come in contact with patients from distant parts of the world.

So few cases of this disease have been reported within the United States, especially cases where infection has been caused by the *Schistosoma mansoni*, that it is thought a report of this case may prove of interest.

A.A.G., Summer Street, East Boston, Massachusetts. Born—Alexandria, Egypt. Age 23. **Chief Complaint:** Pain in chest on each side; dizziness, cough. **Family History:** Mother living and well, in Alexandria. Father dead, probably of meningitis. **Occupation:** Has been fireman and oiler on steamships since the age of 15. **Past History:** Born in Alexandria, Egypt, 23 years ago. At eleven years of age he left there and went to India, remaining about six months. From there patient went to London, England, and thence to Cardiff where he fired on a steamer between the latter point and the Mediterranean, during three years, following which he came to New York.

For the sake of brevity, the discussion of subjective symptoms has been condensed as much as is consistent with a proper outline of the case. A history of dizziness, infrequent epistaxis and frequent sore throat is volunteered. The patient has also experienced indefinite pain over the precordium, and dyspnoea for some little time previous to entrance here. A persistent, unproductive cough has been a constant symptom during the last year.

*Approved for publication by the Surgeon-General.

Gastro-intestinal symptoms have been confined to irregular constipation and several passages of blood with the stools, since 1917. Terminal hæmaturia has been noticed occasionally since 1916.

Present Illness: In 1920 patient had diarrhoea for four days, having from 17 to 24 movements daily. Stools were of a blackish color and much blood and mucus were present. In August of this year patient experienced pain in epigastrium, difficulty in breathing, weakness progressing, dizziness and fainting spells. Pain of an indefinite type was felt about the region of the heart. Indefinite pains throughout the lungs. Cough and hot feeling in throat. All above symptoms becoming worse, patient sought treatment at this hospital. On entrance to the hospital the patient's temperature was 98.5, pulse 80, and respiration 22. Patient well developed and fairly well nourished, rational, and able to be about.

In the interest of brevity, only positive findings are recorded in the physical examination following: It was noticed that the supra- and infra-clavicular fossae were very prominent, and that each apex lagged perceptibly upon inspiration. Expiration was slightly prolonged over each apex, and the breath sounds were roughened. The heart sounds were of good quality, but the second sound was markedly accentuated over the tricuspid area. Slight tenderness was elicited by deep palpation over the gall-bladder region and spleen. All reflexes were present and normal.

LABORATORY FINDINGS.

Urine: Light orange, 1026 acid, odor normal. Negative for blood, sugar, albumen and bile. Repeated examinations disclosed no ova.

Sputum: Repeated examinations have been negative for tubercle bacilli or ova.

Blood: Wassermann negative. Red blood corpuscles, 5,640,000; White Blood corpuscles, 7,000; Hemoglobin, 100%. **Differential:** Polymorphonuclear neutrophils, 47%; small mononuclears, 22%; large mononuclears, 13%; transitionals, 2%; eosinophiles, 13%; basophiles, 1%. Stain—Wright's. Cells counted—200.

Examination of Feces: Color, greenish gray; consistence, soft; reaction, alkaline; mucus, considerable; blood, slight. **Parasites—ova of *Schistosoma mansoni*.**

It is only fair to state that in this case pulmonary tuberculosis was thought of, and not without cause, considering the history and physical findings. Repeated examinations of sputum failed to disclose any tubercle bacilli.

The examination of the blood and the finding of an eosinophilia of 13% was the first clue as to the real nature of the disease.

In talking with the patient it was learned that he was born in Alexandria, Egypt, and up to the age of eleven, had always lived there. Bathing was done in the River Nile, and drinking water procured from the same source. Here, then, we

had the possible source of infection with some parasite, as it is well known the waters of the Nile shelter many diversified types. A stool was procured, the study of which in the laboratory disclosed the presence of the lateral spined eggs of *Schistosoma mansoni*. This gave the diagnosis which is consistent with the history, nationality, subjective and objective symptoms of the patient.

A proctoscopic examination was done and no ulceration nor polypi of the bowel were disclosed by this, and, excepting for slight increased redness just inside the anal margin, the result was negative.

A small amount of feces, of a golden yellow color, admixed with much mucus, was obtained, which, upon microscopic examination, revealed in several instances as many as five ova of the *Schistosoma mansoni* per field. An unsuccessful attempt was made to hatch out some of the ciliated embryos from the eggs in this specimen.

TREATMENT.

It was decided to try emetine hydrochloride in the treatment of this case, as a successful treatment of a similar case with this drug had but recently been reported by Bonnet of Paris. Treatment was instituted on September 20, 1921, with an initial subcutaneous administration of 22 milligrams of the drug in 5 c.c. of sterile distilled water. September 23, 1921, second dose of 33 mgm. was given; September 26, 1921, third dose of 44 mgm. was given; September 28, 1921, fourth dose of 55 mgm. was given.

Owing to the painful swelling caused by these subcutaneous administrations, it was thought best to discontinue this method of employment of the drug. Hence, on September 30, 1921, the fifth dose of 66 mgm. was given intravenously in 10 c.c. of sterile distilled water. Dizziness, coming on almost immediately and lasting about twenty minutes, was the only subjective complaint. Pulse and respiration showed no change.

October 3, 1921, the sixth dose of 77 mgm. in 10 c.c. of sterile distilled water was given intravenously.

October 5, 1921, the seventh dose of 88 mgm. was given as above.

October 6, 1921, the stool was examined, and the ova above mentioned were very numerous and easy to find. The stool was of a slate color, and ordinarily soft consistence.

October 7, 1921, the eighth dose of 100 mgm. in 15 c.c. of sterile distilled water was given. On this date, for the first time, the patient stated that he felt better, and that his appetite was improving.

October 10, 1921, the ninth dose of 100 mgm. in 15 c.c. of sterile distilled water was given.

October 12, 1921, the tenth dose of 100 mgm. as above.

October 13, 1921, the patient developed an irritative, unproductive cough, which was, however, amenable to the ordinary treatment.

October 14, 1921, the eleventh dose of 100 mgm. as above. On this date a stool examined showed the ova more difficult to find, and as many as ten cover slip preparations were examined to find one ovum.

October 18, 1921, the twelfth dose of 100 mgm. as above.

October 20, 1921, the thirteenth dose of 100 mgm. as above.

October 21, 1921, a stool was examined, and no ova found in twenty preparations.

October 22, 1921, the fourteenth dose of 100 mgm. as above. On this date it was decided to stop treatment and study the stools daily for any further appearance of ova.

On October 24, 26, and 27, 1921, stools were examined, after magnesium sulphate had been given, in each of which no ova were found.

On the afternoon of October 27, 1921, the blood picture showed: Red corpuscles, 5,490,000; white corpuscles, 26,400; hemoglobin, 96%; *Differential Count*: Polymorphonuclear neutrophils, 36%; small mononuclear leucocytes, 18%; large mononuclear leucocytes, 2%; transitionals, 3%; eosinophiles, 40%; basophiles, 1%. Number cells counted—300. Stain—Wright's.

Attention is readily called to the marked eosinophilia. The patient exhibited his old-time languidness, and his appetite became capricious. His temperature, which had hitherto been practically normal, rose to 38.2 C. and his pulse to 100. A slight friction rub was discovered in the mid-axillary line about opposite the fifth interspace. The left side of the chest having been immobilized by adhesive strapping, the patient was confined to bed, and the condition cleared up in four days.

Stools on October 28 and 29, 1921, were examined for ova without result, but the blood picture on the 29th proved very interesting: Red corpuscles, 5,510,000; white corpuscles, 27,800. *Differential Count*: Polymorphonuclear neutrophils, 21%; small mononuclear leucocytes, 18%; large mononuclear leucocytes, 0; transitionals, 0; eosinophiles, 61%. Stain—Wright's. Cells counted—300. Hemoglobin—98%.

The red cells were of good color, shape, and size. The urine examination on this date was negative. The blood picture of the 31st was essentially the same. The sputum has been continually examined for tubercle bacilli, fungi, and ova of flukes, with negative results.

October 31, 1921, a roentgenogram of the thorax was taken. The report is as follows: Marked thickening about the hila. No definite pathology of lung fields.

November 1, 1921, a stool examined showed numerous ova again appearing, so the emetin treatment was at once renewed, and November 2, 1921, the fifteenth dose of 100 mgm. in 15 c.c. of sterile distilled water was given.

November 4, 1921, the sixteenth dose of 100 mgm. was given as above. The blood picture

on this date showed a remarkable change from that of October 29, 1921: White corpuscles, 18,800. *Differential Count*: Polymorphonuclear neutrophiles, 48%; small mononuclear leucocytes, 20%; large mononuclear leucocytes, 3%; eosinophiles, 29%. Cells counted—300. Stain—Wright's. A great reduction in the percentage of eosinophiles.

November 7, 1921, a stool examined after a purge of magnesium sulphate had been given, showed but one ovum in thirty preparations, and this ovum was misshapen and somewhat broken up.

November 8, 1921, the seventeenth dose of 100 mgm. in 15 c.c. of sterile distilled water was given. A stool examined on this date for ova yielded negative results.

November 9, 1921, another stool was negative for ova.

November 10, 1921, the eighteenth dose of 100 mgm. was given as above.

November 14, 1921, the nineteenth, and November 16, the twentieth dose of 100 mgm. was given.

It will be seen from the foregoing that the patient received during the course of treatment 16.85 g.m. of the drug.

November 25, 1921, the blood picture showed the following: Red corpuscles, 5,320,000; white corpuscles, 9,800; hemoglobin, 89%. *Differential Count*: Polymorphonuclear neutrophiles, 50%; small mononuclear leucocytes, 29%; large mononuclear, leucocytes, 1%; transitionals, 1%; eosinophiles, 18%; basophiles, 1%. Cells counted—300. Stain—Wright's.

The blood had not yet fully cleared up, but such remarkable changes had taken place in it since October 29 and November 4, 1921, that we were led to believe it would become normal.

From November 8 to November 28, 1921, fourteen stools have been examined for ova. Half of this number were natural movements and half followed magnesium sulphate, as it was hoped that in such manner a more fair and true estimate of the condition could be appreciated. At least twenty preparations were made from different parts of each stool, but in no case were the ova of *Schistosoma mansoni* found.

The patient has steadily gained in weight and appearance. He has lost his languidness and is now wide awake and bright. His appetite has returned. His hoarseness has in a large part disappeared. The pain in the region of the gall-bladder and spleen, previously elicited by deep palpation, is no longer present. The signs noted in the chest during physical examination are no longer found.

During the month of December the patient remained under observation. His stools, sputa and urine were frequently studied, with negative results. The blood picture became normal, and upon January 1, 1922, he was discharged from the hospital feeling well in every way.

RECENT PROGRESS IN PHYSIOLOGY.

BY PERCY G. STILES, BOSTON,

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THE CHANGE OF EMPHASIS.

DURING the past few years one can note a very distinct change in the subjects and methods of physiological research. The science has become more concerned with interpretation than with description. Fewer investigators are engaged in the study of complex coördinated systems, and more are seeking to discover the factors which affect the reactions of isolated cells or elementary tissues. It is as though we passed from observation of an automobile in working trim to an intensive collection of data regarding metals, oil, and gasoline. The new Physiology is less picturesque and more difficult than the old, but it appears to take us nearer to the fundamental properties of living matter. This shift in interest has made it necessary for those undertaking work in our laboratories to come with an equipment different from that which would formerly have sufficed. Detailed anatomical knowledge is rather less serviceable than it was to the masters of the classic period. General Physics and Chemistry now fail to provide the foundation and require to be supplemented by Physical Chemistry and Theoretical Electricity. Mathematics can no longer be shunned by the candidate. In short, the physiologist of the future will be less the naturalist making direct observations upon animals, and more the exact scientist dealing with tabulations and curves.

One feature of this change has been the obvious increase in the importance of Electro-physiology. Not many years ago this seemed a bizarre specialty remote from practical applications. Now it is seen that it promises to throw light on the most intimate mechanisms of stimulation and response. It must be remembered that changes of electrical potential are the only signs of life certainly to be recognized in nerves when disconnected from other tissues. The study of these rapid fluctuations by the ingenious methods now available is steadily making more clear the community of properties underlying the superficial diversity of cellular activities. It is by such technique that Forbes and Miller¹ have recently shown that ether cuts off the ascending nerve-impulses in the medulla. Crile had questioned the efficacy of ether to interrupt the afferent currents, and the latest contribution to the discussion is of the greatest practical interest.

PHYSIOLOGICAL REVIEWS.

It may not be superfluous to call attention to this new publication. The literature has become so voluminous that concise summaries covering special subjects are a necessity. *Physiological*

Reeports is a quarterly prepared for this purpose under the auspices of the American Physiological Society. It is now in its second year. Each volume is to contain about twenty articles written by men at home in their respective fields. Research workers will profit by the extensive bibliography, while a larger number of readers should be interested by the actual content of the reports.

The purpose of the present article is to indicate a few lines of work in which notable progress is being made. There are certain matters of such evident concern to the medical profession that they are not likely to be overlooked. It will be enough to mention two of these: the multiplied studies of the factors in rickets, and the endeavors of investigators at the University of Toronto to obtain in stable form the internal secretion of the pancreas, which is the regulator of carbohydrate metabolism. In these there is high promise of the therapeutic control of diabetes. Without dwelling upon matters so directly related to practice, we will turn to others less likely to be followed in detail by the busy physician.

"ALL OR NONE."

The "All or None Principle" continues to modify our traditional conceptions. Some ten years ago it won its way into our mode of picturing the contractions of skeletal muscle. We then ceased to think of the muscle-fibre as responding in different degrees to graded stimuli. The evidence marshalled by Lucas of Cambridge, England, compelled us to conceive of a slight muscle contraction as the maximal effort of a minority of the fibres, the majority remaining at rest. A little later Adrian showed that a nerve-impulse has the "All or None" character; it cannot reflect the intensity of the stimulus which gave rise to it.

The adjustment of our ideas to the doctrine of Lucas and Adrian has not been an easy matter, but it is gradually proceeding. Any who care to survey the problem may well read a recent paper by Forbes.² A few of the points made by him may be mentioned. If we accept the view that each muscle-fibre responds to stimulation in an "All or Nothing" fashion, and that the same principle holds for each fibre in a motor nerve, we must next ask how it is with the sensory apparatus. Have afferent fibres properties essentially different from those of efferent fibres? If they have not, what are we to think about the relation between stimulation and response on the sensory side? How shall we account for the seemingly smooth gradation of our sensations, and of measurable reflex actions?

Forbes tells us that the evidence will not permit us to think that sensory and motor fibres differ in any important respect. Assuming them to be much alike, we may still admit the following possibilities as we seek to explain how

increasing stimulation of receptive endings brings about increasing responses. First, stronger stimuli take effect on more numerous nerve-fibres. Second, very strong stimuli, though solitary, are capable of developing repeated nerve-impulses. Third, certain rhythms of stimulation favor the penetration of the gray matter by the resulting series of impulses; other rhythms are definitely unfavorable. It would not be profitable to follow the application of these guiding principles to the intricate mechanisms of the central nervous system. It is certain, however, that they will be employed in future analyses.

HIGH LEVEL NUTRITION.

Attention may be called to a protracted study in human nutrition reported by Gulick.³ It deals with over-feeding, and is thus complementary to previous investigations of the results of under-feeding, such as the elaborate one described in Publication 280 of the Carnegie Institution. Gulick made himself the subject of his experiments. By arbitrarily increasing the quantity of his food (without resorting to any artifices to make it more tempting) he carried his daily intake from about 2700 to about 4100 calories. In the course of many months he increased his weight by 10 kilograms, and attained to an equilibrium upon the new diet. Thus he added something like 50 per cent. to his ration, and operated his body with approximately 20 per cent. increase of mass.

These observations are on the whole consistent with the Carnegie findings. Benedict and his colleagues have shown that a man who sacrifices 12 per cent. of his original body-weight may do without some 40 per cent. of his former supply of calories. That is to say, he may maintain the new equilibrium, and still carry out the chief activities of his former program. Doubtless he conserves his muscular expenditures where he can. Summarizing the two studies, we may state that changes in weight are much smaller than changes in energy supply, whether one expands or contracts an allowance that has been habitual. One divergence between the results should be pointed out. Under-nutrition decisively cuts down the basal metabolism; during Gulick's period of excessive intake, this significant quantity remained practically unchanged.

THE PULMONARY EPITHELIUM.

As a rule, the accumulation of new data must be expected to add to the complexity of our conceptions. But now and then a welcome exception is noted; we find our interpretations simplified. Such an instance may be cited in connection with the physiology of respiration. Ten years ago the belief was strongly maintained by Haldane that the pulmonary epithelium can actively promote the movement of oxygen from the alveolar air to the blood. It was

taught that this secretory power came to be exercised at high altitudes and, in large measure, determined the success of acclimatization. An analogy was found in the well-known ability of the swim-bladder of the fish to secrete oxygen, albeit in an opposite way—from the blood to the lumen of the organ.

It has been difficult to credit the delicate endothelial cells of the lung with such a capacity, and it now appears that we are not obliged to make the assumption. Haldane had claimed that the tension of oxygen in the arterial blood of acclimatized subjects living at high altitudes might distinctly exceed the pressure of oxygen in the alveolar air. Such a state of affairs could hardly be explained without invoking a secretory process—an energetic transfer of oxygen to the blood. Careful experiments made last winter in the Peruvian highlands by British and American physiologists have failed to support the secretion hypothesis. Working at 14,000 feet, and using as subjects not only the members of their own group, but also the permanent residents, they found that the oxygen tension in the arterial blood was invariably below that in the alveolar air. Physical diffusion would therefore account for the passage of the gas into the blood.

If we are not permitted to include secretion of oxygen among the processes by means of which the organism maintains itself at high altitudes, we may still recognize the following factors as contributing to the adaptation. The number of corpuscles and the quantity of haemoglobin for a given volume of blood are both increased. The respiratory centre exhibits a modified activity, and by increasing the ventilation of the lungs, keeps the alveolar oxygen pressure nearer to the atmospheric than is the case at sea-level. Doubtless the vasomotor system gives efficient direction to the circulation. Surface relations between the air and the blood appear to be improved, and the permeability of the epithelium is probably increased.⁴

ALVAREZ ON THE ALIMENTARY CANAL.

An interesting monograph of the past year is the book by Alvarez.⁵ In it we have presented a body of evidence largely from original studies, emphasizing the autonomous capacities of the digestive tract. It is impossible in a brief abstract to do justice to the argument. The fundamental thesis is that the canal is normally characterized by a "metabolic gradient"—that the spontaneous rhythm of the musculature is progressively slowed as the successive segments are passed. In other words, we have here a condition comparable to that which we recognize in the heart. The auricle normally unloads to the ventricle, and acts as "pace-maker." We explain this by saying that the auricle has a superior rhythmicity; after it has executed a contraction it recovers, and is ready to repeat more promptly than is the case with the ventricle. In the same terms Alvarez would explain the

polarity of the intestine, and the usual advance of the peristaltic waves in a fixed direction.

He holds that reversal of peristalsis is a much more frequent occurrence than has commonly been assumed. It would be expected to set in if the irritability of any intestinal segment should be so intensified as to exceed that of the region next above. Such a change may conceivably result from inflammation. The contention is supported at length, and seems likely to modify long-accepted views. For several years Alvarez has maintained that the sensory symptoms of intestinal disorders are largely the result of mechanical conditions, and not of toxæmias. At this point he is supported by the recent work of Donaldson and his associates.⁶ These investigators, after personal trials involving no little discomfort, conclude that the ill feeling attending constipation is chiefly due to the mass of material distending the intestine, and to reflex disturbances therefrom, rather than to poisonous decomposition products.

DIFFERENTIATION OF MUSCLE.

One of the most revolutionary doctrines now before us is that which is advocated by Carey.⁷ He advances the opinion that the three contrasted types of contractile tissue found in the mammalian body owe their peculiarities to the use to which they have been subjected, rather than to any original characteristics. This is a dynamic theory of development. It suggests that smooth muscle, if persistently acted upon by a force alternately stretching it, and permitting it to contract, should acquire the nature and appearance of cardiac tissue. To test this possibility, Carey has patiently applied a distending pressure to the bladder of a young dog, injecting an antiseptic solution to fill the cavity of the organ, and then allowing it to empty itself. He reports that after a long course of these exercises the muscle cells from the bladder-wall have the microscopic aspect of cardiac elements. Such a finding, if confirmed, will be of the highest importance. It is certain to be rigorously examined.

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TUBERCULOSIS OF ANKLE JOINT AND TARSUS.

BY HENRY J. FITZSIMMONS, M.D., BOSTON.

[From the Orthopedic Clinic of the Children's Hospital, Boston, Mass.]

In the December 17, 1910, number of the *American Medical Association Journal*, Dr. James Warren Sever published an analytical study of the cases of tuberculosis of the ankle

joint and bones of the foot which were on record at the Boston Children's Hospital from 1868 to 1910. In his conclusions he states: "The expectant or conservative method of treatment is preferable to the operative one. Time is saved and deformity less under the conservative plan than by the operative method. There is also less danger of secondary joint involvement and general tuberculosis by pursuing the non-operative plan." Ten years frequently brings forth many changes in the treatment of any surgical condition. In order to check up the results of the treatment of tuberculous lesions in the ankle joint and tarsus at the Children's Hospital, the records were collected of all such cases for the last ten years. There have been treated at the Hospital during that time:

	Spine.	Hip.	Knee.	Ankle.	Elbow.	Total.
Wards	635	462	114	44	6	
O. P. D.	301	273	92	52	9	
	936	735	206	96	15	1,988

From 1868 to 1910 the clinic treated 7474 cases of bone and joint tuberculosis. Of these 7474 cases 213 were of the ankle joint and bones of the foot. In the last ten years there have been treated 1988 cases of bone tuberculosis; 88 of these being involvement of the ankle joint and bones of the foot. From such comparisons, we have become impressed with the fact that tuberculous lesions in bones and joints are not as frequent as they were ten years ago. For example, there have appeared for treatment 88 cases of tuberculosis of the ankle joint and tarsus as against 213 such cases treated in the previous ten years.

Notwithstanding the evidence submitted by Doctor Sever in favor of the conservative type of treatment, the writer has been surprised at the number of cases operated upon before and following admission to the hospital.

To correlate results from the different types of procedure, we have for the last two years, gradually gathered all the tuberculous ankle joints and tuberculous lesions of the tarsus for the purpose of comparison and study, and grouped them into two large classes. In one class have been placed all cases that have received surgical interference. Operations in this group have included all grades, from the simple so-called medical incisions to excisions of one or more bones. In the second class have been placed all cases that have received no surgical interference; and in this group those cases that had abscess formation with spontaneous rupture of the contents without surgical assistance have been included.

There were examined 88 cases; of which 43 were boys and 45 girls. The traumatic factor in relation to the sex of the patient was found to be of very little value in a child under twelve years of age. Under twelve years of age, the activity of boys and of girls is about the same and the opportunity for trauma is therefore practically the same. In this series, the right ankle was

affected 45 times and the left ankle 43 times. In the histories it was noted that the patients had been exposed to tuberculosis by one or more of the members of the family in only $3\frac{1}{2}$ of the cases. The history of trauma was considered of no value and therefore not included in this report.

Patients sought medical aid usually after a definite lapse of time from their first symptom. The duration of the time from their first symptom before medical aid was sought varied from 3 to 12 months; the average being $7\frac{1}{2}$ months. In this regard it is instructive to note that the older the child, the greater the duration between the first symptom and the request for medical aid. This may be partially explained by the greater ability of the bone to support the structures involved.

The diagnosis of tuberculosis of the ankle joint and tarsus in these cases was based upon the following facts: (a) the presence of bone or joint involvement of a chronic nature without a picture of an acute infectious origin or trauma and persistent protection of the joints involved; (b) x-ray appearances which were early suggestive, but not definitely diagnostic; (c) the presence of a positive Von Pirquet reaction; (d) a frequent negative Wassermann reaction; (e) frequent bacteriological and pathological reports of material removed at the time of operation.

The writer appreciates that the weakness of such a paper as this is that only from the operative cases may we obtain material upon which to make a positively scientific diagnosis. However, one must grant to experience and careful clinical observation the right to make acceptable diagnoses.

The tables show briefly and clearly the end results after an elapse of time of the cases treated by operated interference and those cases treated by non-operative procedure. There were 43 cases treated conservatively by plaster fixation, Thomas ring splint, high sole, and crutches. In this survey there were found 45 cases that had been subjected to some type of operation.

Of the cases treated without operation: 12 did not have sufficient data and 6 were still under treatment so must be excluded from any summary of results.

The remaining cases presented the following results:

There were 10 cases under treatment between 10 and 18 months. In this group 1 case developed tuberculosis of the elbow and one developed tuberculosis of the knee. All presented absence of marked deformity or marked restriction of motion. There were 3 cases under treatment for two years; 1 showed slight deformity, and 2 showed no marked deformity nor restriction of motion.

There were 4 cases under treatment for three years: 1 showed slight deformity and slight restriction of motion; 2 showed no deformity of marked degree, but showed restriction of motion;

spine; 1 case of general tuberculosis; and 1 case of tuberculous meningitis.

From a comparison of this data, we feel that the operative treatment of tuberculosis of the ankle joint and tarsus in children is usually harmful. Time is not saved, deformity is not decreased, and motion is not preserved. When the infection is sharply localized so that a direct surgical procedure be followed, it might be of distinct advantage to resort to careful excision. Unfortunately, at present this is not possible, and, therefore, most surgery is to be avoided. Incision of the soft parts in the direction of the supposedly affected bone or joint has not been of any benefit. The abscess which presents itself and which spontaneously ruptures generally protects the surrounding tissues from invasion and from overwhelming infection. The cases in the operative group that were followed by the quickest healing and usually by the best surgical results were those that had been submitted to small incisions of the fluctuating mass of an abscess about to spontaneously rupture.

We are constantly hearing and frequently not heeding the teaching of the basic principle of the "equation of the foot." This "equation of the foot" in a growing child is constantly changing and is always disturbed in such operations as have been observed in establishing drainage or removing sequestra.

Tuberculosis of the ankle joint and tarsus in children should be treated conservatively. Local rest by fixation, protecting against the strain and mechanical pressures which the individual bones or points are subjected to, should be rigidly enforced.

Heliotherapy definitely aids before as well as in the presence of sinuses. Operative interference should be resorted to only after careful consideration and then the plan of procedure should be definitely understood. There is a greater danger of secondary involvement and general tuberculosis following operations than without. A large proportion of cases of tuberculosis of the ankle joint and tarsus get good functional results with very little deformity, but are more likely to get these results in a shorter time by the non-operative procedure.

ACCOMMODATION TO THE ANOXEMIA OF HIGH ALTITUDES.*

BY ALFRED C. REDFIELD, PH.D., BOSTON.

In the anoxemia which results from residence in the rarefied air of high altitudes one sees phenomena which accompany cardiac and pulmonary disease, stripped of the complicating features which are due to the primary pathological condition. These phenomena have been the object of study of an expedition led by Mr. Joseph Barcroft of Cambridge University, which

has recently returned from the Andes of Peru. There, eight investigators, of which the author was one, enjoyed rather unusual facilities, having at their disposal a laboratory car on the Central Railroad of Peru. This railway climbs from sea level to an altitude of 15,665 feet in a distance of 171 kilometers, then descends to Oroya at 12,180 feet, to connect with a branch line to Cerro de Pasco, which, at an altitude of 14,200 feet, supports a native population of some ten thousand. As the result of this facility, and the cooperation of the officials of the Cerro de Pasco mines, a series of observations was made upon the physiological changes which accompany the recovery from mountain sickness, such as hitherto have never been obtained.

In the Andes the disability, mountain sickness, which most men suffer on coming into the rarefied air, is termed *seroche*. So definite is its symptomatology, so general is its occurrence in these not unpopulous regions, that it deserves some attention as a clinical entity. Its severity is sufficient to give it, in connection with the mining industry, a certain economic importance. While a few men were met who had never felt it, and many who had suffered but mildly, a very large number are so greatly affected as to be completely incapacitated for several days. In at least one authentic instance the *seroche* of a normal, healthy person has been terminated by death. Each case is an individual story and, up to the present, no one has been able to predict who will and who will not be affected. A description of cases of two degrees of severity will serve to picture the chief features of the disorder.

Making the ascent by train, one lightly touched by *seroche* experiences his first symptoms at an altitude of 10,000 feet or more. Lassitude, headache, usually frontal, and growing in severity, and perhaps nausea are felt. One feels cold, particularly in the extremities; the pulse quickens, respiration becomes deeper and more frequent; the face is pallid, lips and nails are cyanotic. On descending from the summit to Oroya, at 12,000 feet, though a marked improvement is felt, one finds himself reduced to a helpless condition of weakness which renders the least muscular effort irksome and productive of shortness of breath, dizziness, and palpitation. The night's sleep is restless, and on waking one feels much as he does on venturing onto his feet after recovering from an acute infection. In two or three days strength returns, the color improves somewhat and all but the more severe forms of exertion may be undertaken without distress. The majority are less fortunate than this. During the ascent the symptoms are qualitatively the same, but frequently more severe, and nausea gives way to vomiting. The night's sleep fails to bring relief; severe headache, gastrointestinal instability, and weakness continue for several days; the body temperature may be supranormal (102° F. by rectum), and at times one is aware of palpitation. Cyanosis

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is marked. After three or four days in bed, relief comes and in a week normal activity may be resumed, though for many days breathlessness follows any unusual exertion and the cyanosis, though diminished, persists.

It is scarcely to be questioned that insufficient oxygenation of the blood is, primarily, responsible for *seroche*. The physiological basis of the production of its various symptoms raises many interesting questions which cannot be considered here. Rather let us consider how it is that the body compensates for the reduced oxygen tension in the atmosphere so that the visitor, who on arrival is reduced to helpless invalidism, in a few days is able to get about, to carry on physiological experiments all day, or to dance away half the night; so that the seasoned engineer or mechanic can do a full day's work; so that the native miner can carry his load of ore up the steep ladders of the mines.

In recent years it has been maintained that the chief factor in this compensation consisted in the development by the pulmonary epithelium of a latent function, the power of secreting oxygen into the blood.¹ As a result it has been claimed that the tension of oxygen in the arterial blood may be kept up, even at an altitude of 14,000 feet, to 90 or 120 mm., that is, to tensions equal to those existing at sea level and nearly twice as great as that of the oxygen which is in the alveolar air at the time. The development of recent methods made it possible to reexamine this question in Peru. There it was found that in no case did the tension of oxygen in the arterial blood exceed its partial pressure in the air of the alveolus, even after three weeks of acclimatization. The arterial blood remained from 81 to 91 per cent. saturated—in contrast to the normal saturation of 95 per cent. which had existed at sea level.

Two other accommodating actions which had previously been described as accompanying life at high altitudes were amply confirmed at Cerro de Paseo.² The first is that the quantity of haemoglobin, or number of red corpuscles, in a unit quantity of blood is increased 20 or 30 per cent. The second is that as a result of an alteration in the activity of the respiratory center, the ventilation of the lungs is sufficient to raise the tension of oxygen in the alveolar air some 15 to 20 millimeters higher than it would have been had the ventilation of the lungs continued as at sea level to maintain the carbon dioxide tension of the arterial blood at 38 or 40 millimeters. As a result the tension and quantity of oxygen in the arterial blood is increased in measure. A second consequence of the increased ventilation of the lungs is that the tension of carbon dioxide in the alveolar air falls to 23 or 25 millimeters.

This is but part of the story. At Cerro de Paseo it was found that when acclimatization was complete the oxygen combining power of the blood had changed. As a result, under a tension of oxygen such as that existing in the alveolar

air at that altitude it now became more completely saturated than it would have, had the blood remained as at sea level. In this way the degree of saturation may be increased about 5 per cent.

One is at once led to search for other alterations which may be correlated with or used to account for this change in the ability of the blood to combine with oxygen. The reduction in the carbon dioxide tension of the arterial blood and alveolar air, already referred to, is suggestive in this connection, for it is known that alterations in the quantity of carbon dioxide present have a great effect on the equilibrium between oxygen and haemoglobin. In fact, a change in the carbon dioxide tension from 40 to 25 millimeters, such as occurs in the arterial blood on going from sea level to an altitude of 14,000 feet, is sufficient to alter the oxygen combining power of the blood in just about the magnitude which was found to occur at Cerro de Paseo. The situation is not a simple one, however, and at present the conclusion cannot be drawn that the alteration is directly due to the change in carbon dioxide tension. The reason for caution is that in the body an important compensation for the reduced carbon dioxide content occurs. If it did not do so the hydrogen ion concentration of the blood would be considerably decreased, for this property is dependent upon the relative quantities of carbonic acid and bicarbonate which are present. In actuality it is found that the decrease in carbonic acid is nearly balanced by a decrease in the bicarbonate of the blood and consequently the reaction is little if any more alkaline than at sea level. In the experiments which demonstrated that carbon dioxide influences the oxygen combining power of the blood, on the other hand, the quantity of bicarbonate was unchanged and consequently the blood became more alkaline as the carbon dioxide tension was decreased. The cases, consequently, are not strictly comparable and judgment must be withheld until more applicable experiments are performed.

The foregoing describes the conditions found in the members of the expedition after a residence of two or three weeks at a high altitude. How much further would these compensations have been developed had they prolonged their stay into months or years? Examination of the Anglo-Saxon mining men and of the native Cerro de Pascans gives an answer. The former had been in residence at 12,000 or 14,000 feet, save for brief periods, for two to nine years. Of the latter many had been born and lived for generations in the high altitude.

Of the Anglo-Saxons, none showed a tension of oxygen in the alveolar air and arterial blood which indicated that the respiratory compensation had developed further than in ourselves. Nor did any of them exhibit a higher percentage saturation of the arterial blood than did certain members of the expedition. In accordance with this, practically all, and particularly the more

florid types, appeared distinctly cyanotic. Among this group the red blood cell counts also did not exceed appreciably those attained by us during our short stay. These men were undoubtedly capable of much greater exertion than the most fit of the visiting investigators, but the difference was apparently due to such factors as differentiate the athlete from the sedentary worker at low altitudes, rather than to any measurable change in the blood picture.

Turning to the natives of Cerro de Paseo, it is noteworthy that many, especially those of Spanish extraction, exhibited striking signs of chronic anoxemia. Many were cyanosed to a degree not exhibited by the Anglo-Saxons, while clubbed fingers occurred commonly. In the three cases in which the oxygen saturation of the arterial blood was measured, figures were obtained which compared with those from the members of the expedition in whom compensation was least satisfactory (82-86% saturation). In other directions the native Peruvian has acquired characteristics which differentiated him from the Anglo-Saxon. In many the number of red corpuscles far exceeded that found in the most seasoned mining engineer. But of more interest than this, a mere quantitative difference, is the fact that when compared with the European of like stature the native is found to have a chest of considerably greater volume. Whether this modification has become an hereditary character, or is the result of growing up from childhood in a rarefied atmosphere, is an alluring question.

In this as in previous studies of the anoxemia of high altitudes great attention has been paid to the oxygenation of the blood in the lungs. Because a considerable body of data has accumulated concerning this subject, attention must not be allowed to divert from what is really the cardinal problem, namely, the supply of oxygen to the tissues. It is to this end, if any, that the compensations in the oxygenation of the blood are directed.

The problem which confronts the circulatory and respiratory systems is to supply the tissues with oxygen at an undiminished *rate* when the body is exposed to an atmosphere in which the pressure of oxygen is subnormal. That this may occur it is necessary (1) that the blood contain enough oxygen to meet the requirements of each tissue through which it is circulating, and (2) that conditions shall be such that this oxygen tends to pass across the capillary walls as rapidly as is needed to keep pace with the oxygen consumption within the tissue.

At first sight it would appear that in the degree of anoxemia with which we are concerned it is not the quantity of oxygen which is deficient. To take a normal case, at sea level, the arterial blood is 95% saturated, the venous blood as it returns to the lung may be 65% saturated, the tissues have removed from it but 30% of its total capacity. At an altitude of 14,000 feet had no compensation occurred the arterial blood might

be but 65% saturated, and if the circulation rate and total metabolism remained unchanged, the venous blood as a whole would be 30% less saturated than this, or 35% saturated. This would seem to be a large margin of safety, but it must be noted that it represents the average condition of the venous blood from all parts of the body. Certain organs, and particularly the heart, must reduce the blood far more than this. Whether the margin would be sufficient for these during rest may be doubted; that it would be inadequate during muscular exercise seems very probable.

The chief condition which determines the rate at which oxygen passes from the capillary into the tissues, unless one assumes some secretory power in the capillary wall, must be the mean difference of pressure between the oxygen in the blood and in the cells in question. Unfortunately, this difference in pressure cannot be estimated without a knowledge of the pressure of oxygen within the tissues. We may, however, gain a rough idea of the magnitude of the pressure head of oxygen within the systemic capillaries from a consideration of the oxygen tension in arterial and venous blood. In comparing the conditions observed at 14,000 feet with those obtaining at sea level it was found that the arterial oxygen pressure had fallen from 100 to 55 mm.; the venous oxygen pressure from 35 to 28 mm. Clearly the pressure head of oxygen in the capillaries is reduced, even with the subject at rest and after all measurable accommodations were completed.

How may the various compensatory changes which occur in the blood at high altitudes be evaluated in their effect on the quantity of oxygen available for the tissues and the pressure at which and by which it is made available? The rise in the oxygen pressure of the alveolar air which results from increased ventilation is of obvious advantage, for it will increase commensurately the tension of oxygen in the arterial blood entering the systemic capillaries. And since this increased arterial tension will be accompanied by an increased oxygen content, the removal of a definite quantity of oxygen from the blood in its passage through the capillaries will leave it as venous blood with a correspondingly increased oxygen content and pressure. Because of the peculiar shape of the dissociation curve, the removal of a given quantity of oxygen from the blood will cause a greater drop in the oxygen pressure if the arterial oxygen pressure is high than if it is less so; but even taking this fact into consideration, it may be concluded that a rise in the alveolar oxygen tension will have a considerable effect on the mean tension of this gas in the systemic capillaries.

The change in the oxygen combining power of the blood, which at first sight appears to be such a striking adaptation, is in reality of very little advantage in oxygenating the tissues, aside from the fact that it makes about 5% more oxygen available. The increased oxygen content is held in the blood at no increased pressure, conse-

quently there is no greater tendency for oxygen to pass from the blood to the respiring cells of the body. Similar considerations apply to the augmented oxygen capacity of the blood which results from the increase in the number of red blood corpuscles. There is 20 or 30% more oxygen present in the capillary circulation which is undoubtedly an advantage during exercise, but the pressure which is driving it into the tissues is not directly magnified. In one respect, however, the pressure head is augmented by this phenomenon. Because of the increased capacity of the blood, the removal of a given quantity of oxygen by the tissues will result in a smaller fall in the percentage, to which the venous blood is saturated and consequently to a smaller change in the venous oxygen pressure. One may estimate that an average increase in the oxygen capacity of 20% will serve to raise the venous oxygen pressure three or four millimeters in this way. The polycythemia consequently will have some but not much effect upon the rate at which oxygen is supplied to the tissues.

In the foregoing discussion it has been assumed that the output of the heart and the rate of circulation remained unchanged. If the blood were circulated at a greater rate through the capillary system, thus bringing to the tissues a greater quantity of oxygen in a given time, in some measure a deficiency in its oxygen content might be overcome. Moreover, the more rapid the circulation the less oxygen would each increment of blood give up in its passage along the capillary and the less would be the reduction of oxygen pressure in the venous blood. When it is considered that at sea level the blood enters the capillaries with an oxygen tension of about 100 mm., and leaves as venous blood with tension reduced to 35 mm., having given up 25% of its full oxygen capacity, whereas at Cerro de Pasco the arterial oxygen tension may be but 55 mm., and with an equal oxygen consumption the venous tension would fall to 28 mm., it does not seem extravagant to assume that an increase in the circulation rate of one or two hundred per cent. would be required to bring the mean oxygen pressure up to its sea level value. The method which was available at Cerro de Pasco for measuring the output of the heart is liable to errors as large as 20%, but it would serve to demonstrate any change in the circulation rate as great as this. In fact, it showed that the circulation rate does not differ in one direction or the other from the normal value at sea level by more than the limit of experimental error.

When all compensations are considered two facts remain, the implications of which challenge the imagination and point the way toward future investigation. The first is that in the fully acclimated individual the oxygen tension is 45 millimeters below normal in the arterial blood, 5 or 10 mm. below normal in the venous blood. The mean pressure head of oxygen in the blood of the systemic capillaries must consequently be less than at sea level. The second

is that the total oxygen consumption of the body at rest is unchanged. How is it that the tissues take from the blood and consume an undiminished quantity of oxygen when it is delivered to them at a reduced pressure? Is there at sea level an unnecessary excess of oxygen pressure in the blood? Or has some unknown compensation taken place in the tissues so that the velocity of oxidation within them is unchanged by the diminished pressure? Has the protoplasm, like the hemoglobin, altered in its affinity for oxygen? These are the problems which future high altitude investigations must attack.

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THE CLINICAL SIGNIFICANCE OF SUDDEN ABDOMINAL PAIN.*

BY ALFRED M. ROWLEY, M.D., HARTFORD, CONN.

THE theme of this paper is: Sudden, severe abdominal pain accompanied with shock and followed by muscular rigidity is indicative of a perforative lesion and calls for immediate surgical interference.

The reason I have chosen this subject is because within the last year I have seen several cases presenting the above symptoms in which the surgical treatment was delayed, to the detriment and hazard of the patient, and I am convinced that the operative diagnosis was postponed for too long a time, waiting for the later corroborative signs.

Pain is a relative word used to denote any suffering from discomfort to agony. As here employed, it expresses a sudden, sharp, severe and acute distress, which is generally accompanied with a cry. The cause of the pain is the shock experienced when a foreign substance, the content of one of the hollow viscera, is thrown out into the general peritoneal cavity. The immediate pain is due to the over-distention of the viscus, causing a mesenteric pull, and to the trauma and chemical irritation of the peritoneum, and, I believe, not to the rupture of the viscus, *per se*. For it is well known that the peritoneal covering of the intestine and stomach is not sensitive to trauma, as the bowel may be handled or incised without producing pain, providing there is no tug upon the mesentery, nor irritation to the parietal peritoneum.

The sensory nerve supply of the parietal peritoneum is intimately connected with that supplying the muscle wall, and a tetanic contraction immediately occurs when there has been a peritoneal injury. This persists in a majority of cases, but a subsequent relaxation may occur if the trauma is slight, as that experienced in the out-pouring of gas with but little fluid from a

*Read before the Hartford County Medical Association.

small intestinal perforation; the spasm, however, again reappears if septic peritonitis develops. In this connection it is to be noted that in the artificially produced pneumoperitoneum the patient experiences but the slightest discomfort.

These three symptoms—sudden pain, shock and muscular rigidity—are the cardinal signs of the surgical abdomen. They are, generally, accompanied with other phenomena, depending upon the location and character of the lesion: such as nausea and vomiting and those referable to shock—as cold, sweating skin, pulse of lowered pressure; and rapid, short, catchy respirations, thoracic in character, due to the lack of abdominal mobility, and cyanosis with the expression of the face indicating anxiety and pain.

Later these symptoms may be augmented with others such as obliteration of the liver dullness, rise in temperature and pulse rate, and as the septic peritonitis develops, by a hyper-leucocytosis and increased percentage of polymorphonuclears, their increase generally preceding the total by an hour or two. All these corroborative signs make for a positive diagnosis, but they may not appear for six to eight hours, by which time the operation should have been performed.

I do not wish to minimize the value of the history of the patient, previous to his experiencing pain. This may point to trauma or history of pre-meal distress and often gives a clue to the location of the perforation.

Here, I wish to make myself clear and to differentiate, if possible, between the distress occasioned by a perforation and that experienced in colic, as appendiceal, biliary, ureteral, etc.

The chief characteristic of a rupture or perforation of a viscus is the suddenness of the attack, as a rule, with little, if any, prodromal distress. In a duodenal or stomach perforation there may, or may not be, a history of prolonged indigestion, but the pain experienced following the perforation is entirely different in character from the previous indigestion distress; whereas in the various colics, there are generally anticipatory symptoms. Preceding gall-bladder colic there is generally a heavy, dull pressure and distress in the epigastrium, then the pain of the colic follows, intermittent and increasing in severity with a subsequent lessening in intensity. In appendiceal colic, the first symptom may be epigastric distress, often quite severe in nature and attended with nausea, but the pain is not of the sudden character of perforation and is prolonged, easing on the appendix emptying itself or upon the muscular death of the organ. Even in the very acute fulminating forms of appendicitis, the location of the early tenderness and rigidity, before general peritonitis has developed, will differentiate it from the ulcerative perforations of a viscus into one of the serous cavities. In both of these conditions surgery is imperative.

In the child, the condition of intussusception is attended with sudden pain, shock and some rigidity of the abdomen. This may closely simulate a perforation and may be very difficult to differentiate. In early cases a tumor of the right abdomen can generally be felt. This again is purely a surgical condition.

In adults diaphragmatic pleurisy, hernia, angina pectoris, or the girdling pains from cord lesions may, in exceptional cases, simulate perforative abdominal lesions, but a careful examination and history should clear up the diagnosis.

In the lower abdomen the symptoms experienced by the twisting of the pedicle of a cyst or a pedunculated fibroid, may resemble a low abdominal rupture. In fact, I operated in the New Britain Hospital a few years ago such a case, presenting a low-grade peritonitis with muscular rigidity and found a small fibroid with a twisted pedicle arising from the fundus of the uterus. This patient was seen late and the pre-operative diagnosis was a perforative lesion.

Nothing as yet has been said about the so-called "slow leak" that may occur in the chronic form of perforation—such as in penetrating ulcers of the duodenum. These ulcerations are generally walled off by fat, exudate, omentum or bowel. They are associated with quite severe, sudden pain with little or no shock and the rigidity following is more or less localized. In fact, these symptoms are very typical of other conditions and more nearly resemble the out-pouring of fluid into the lesser abdominal cavity from a necrotic pancreas.

The common causes of perforation of the hollow viscera are—first: penetration by foreign bodies; second: trauma of the abdominal wall, such as occasioned by a blow, sufficient in its force to cause, when transmitted to the viscus, sudden rupture; third: perforation, the result of necrosis, secondary to thrombosis, either pathological or traumatic; fourth: traumatic rupture from over-distention of a viscus from within; fifth: and the most common, the perforation of ulceration due to infection.

Here, I briefly report a few cases seen in the last year to illustrate several of the various causes.

CASE 1.—A. D., male, of South Manchester, Conn.

Seen May 20th, 1921—Physician, Dr. Burr.

Age 44. Occupation: painter. Weight: 160.

Previous History of pre-meal distress and post-meal indigestion.

Present History—At 11 A. M., while at work, he was taken ill with a sudden, severe epigastric pain, accompanied with nausea, vomiting and shock, with abdominal rigidity. He was given morphine and sent to the Manchester Memorial Hospital. Dr. Burr reported the case to me in the early afternoon and we operated him that

evening, at which time he had intense tetanic spasm of the abdominal wall. The pre-operative diagnosis was a perforative lesion of the stomach or duodenum. At operation a perforation of the duodenum was found and sutured. The abdomen was quite full of flocculent fluid. The opening was purse-stringed and then fortified by omentum. No gastroenterostomy was done as the condition of the patient would not warrant it. He made apparently a perfect recovery. The elapsed time in this case was approximately twelve hours from the time of the perforation to the operation—too long, I believe, but he was strong and well nourished and the fluid escaped was not too infectious.

CASE 2.—I. T., male, age 65.

Entered Hartford Hospital, May 6, 1921.

Previous history of constipation.

Present History—On the evening of May 5th he took an enema—his daughter thought he used a garden hose. Following this he had severe pain in the abdomen and was admitted to the hospital at 7.15 A. M., at which time his abdomen was generally rigid and he was suffering intensely. Temperature was 101.8, pulse 100, leucocyte count 4,800, differential 63 and 37. Pre-operative diagnosis was made of a perforative lesion of the colon. At operation a small perforation of the descending colon was found. The opening was not at the base of an epiploica, nor was there any gross pathology of the colon. The peritoneal cavity was badly soiled by the escape of fluid. The perforation was closed at operation and the abdominal cavity was drained. Death resulted the following day. The length of time elapsed between perforation and operation was approximately eleven hours, altogether too long a time, and yet he probably had a lethal condition, from the general flushing of the cavity by an enema through the perforation of an organ containing the most infectious bacterial flora.

CASE 3.—J. W., male, age 28. Occupation: fruit salesman.

Entered Hartford Hospital, March 2nd, 1921.

Present History—Yesterday while at work, patient was carrying a box in his arms. He fell and landed with considerable force against the box, injuring his abdomen. He suffered intense pain. He went to his home and his physician, Dr. Couch, sent him to the hospital, at which time his abdomen was generally rigid. His temperature and pulse on admission were normal. The pre-operative diagnosis was a traumatic, perforative lesion of the bowel. At operation a rent was found in the terminal portion of the ileum. This was closed. The general abdominal cavity was drained. The patient made an uneventful recovery. There was considerable elapsing of time in operating this case because of the patient not realizing that he was dangerously hurt, and he delayed calling his physician.

CASE 4.—J. R., male, age 55. Occupation: farmer.

Entered Hartford Hospital, June 26th, 1921.

Present History—The day before, about 4.30 P. M., the patient was struck in the abdomen by a wagon pole, at which time he experienced severe pain, followed by intense distress. Immediately after the accident the patient vomited. On admission there was generalized spasm, some retraction and tenderness over the whole abdomen, most marked in the right iliac fossa. Leucocyte count 15,800—differential, 88/12.

Pre-operative diagnosis—Traumatic rupture of the bowel.

At operation the peritoneal cavity was found filled with intestinal fluid. In the right abdomen the intestines were adherent with fibrous exudate. A perforation was found near the terminal ileum. The opening in the bowel was closed and the abdomen was drained. Patient was discharged from the hospital August 7th, his wound nearly healed. In September he developed a cough and a tuberculous condition of the chest and he has since died. The elapsed time between the injury and operation in this case was twenty-two hours, and the patient consented to be operated only after great urging by his family physician, Dr. Elmer, and the physicians in attendance at the hospital. The operative recovery was quite remarkable, considering the amount of peritoneal soiling.

CASE 5.—G. R., female, age 31. Physician—Dr. Couch.

Entered Hartford Hospital, August 12th, 1921.

Present History—At 8 P. M. on the evening before admission to the hospital, she was seized with sudden, sharp pain in the lower abdomen. The distress continued. Patient was in a condition of shock. Upon admission she was quite tender in the lower half of the abdomen, with but little muscular spasm. The patient's color was white and she looked nearly exsanguinated. Pre-operative diagnosis of a perforation of a Fallopian tube from tubal gestation was made. Before opening the abdomen she was transfused with 540 c.c. of blood. At operation a rupture was found in the left Fallopian tube near the uterus. Much blood was found in the abdominal cavity. The abdomen was closed without drainage. Patient made a good recovery.

I report this case because it seems to me that such ruptures must be classified under perforative lesions. It belongs to the class of perforations occasioned by the over-distention of a viscus from within. These patients have the symptoms of acute pain and shock, but the muscular rigidity of the abdominal wall is likely to be much less because of the less irritating chemical nature of the fluid evacuated. In these cases, many times, operative interference may be delayed. In this particular patient such

delay was attended by great hazard, as the rupture was near the uterus and she apparently constantly lost blood.

CASE 6.—M. S., female, age 73. Physician—Dr. Bean of Rockville.

Entered the Hartford Hospital on May 23rd, 1921.

Present History—Three days ago the patient had a sudden, severe upper abdominal pain accompanied by shock and vomiting, since which time she has been in constant distress, presenting a rigid abdomen with obstinate constipation. On entering the hospital the abdomen was found distended and rigid. She had a leucocytosis of 20,000, differential of 86/14, temperature of 99, rectally, and pulse of 80. The pre-operative diagnosis was obscure, because of her age, distention and rigidity of the abdomen, together with the inability to relieve the constipation by enemata. A diagnosis was made of acute obstruction of the bowel from an unknown cause.

At operation a low mid-line incision was made. The peritoneal cavity contained bloody fluid and fat necrosis was present. This incision was closed. An upper right rectus incision was made. The gall-bladder, which contained no stones, was drained. A colostomy was done to relieve the bowel distention. The patient had a long convalescence, and on July 28th under novocain, sutures were taken in the colon to close the colostomy. On August 8th patient was discharged, since which time she has entirely recovered.

I report this case because it represents the rupture of a viscus from necrosis, although not classified as a hollow organ, yet the out-pouring of a large amount of fluid material into the lesser abdominal cavity may present symptoms closely simulating the perforation of a peptic ulcer. The differentiation generally can be drawn, however, and a diagnosis made if these cases are seen early. They are attended with sudden pain, shock and some abdominal rigidity, but the maximum pain is often to the left of the mid-upper abdomen, attended with cyanosis and some respiratory distress, together with pain in the back, particularly on the left side.

CASE 7.—C. C. McM., Jr., male, age 27.

Entered the Hartford Hospital, Sept. 2nd, 1921.

On the service of Dr. E. A. Wells and Dr. J. B. McCook, to whom I am indebted for the privilege of presenting this case.

Present History—The patient had been in bed at home for two and one-half weeks with a diagnosis of typhoid fever. At 4 A. M. on the day of admission to the hospital he complained of severe, sudden abdominal pain, accompanied with shock, cold and clammy skin and rapid and feeble pulse. He was seen by Dr. McCook, who said that at the time of the first examina-

tion the patient had some abdominal tenderness and some muscular rigidity. He was brought immediately to the Hartford Hospital, and on entering the hospital one hour later, all the abdominal tenderness and muscular rigidity had disappeared. He had a leucocyte count of 3,600 at 7 A. M., differential count of 63/37. At 2 P. M. his leucocyte count was 8,500, differential 85/15. At 7.30 P. M. he had a total count of 7,000, differential 82/18. During the early evening of the day of admission the abdomen was becoming rigid and an operation was performed by Dr. E. A. Wells. An ulcerated perforation of the cecum was found. There was a small amount of fluid in the abdomen, the intestines were inflated and the patient's condition was poor. The perforation was closed. After the operation he was transfused with saline solution. Death ensued on the following day.

This case, to my mind, is by far the most interesting that has been reported, as it illustrates the point that a small perforation may be attended with sudden pain, shock and slight muscular rigidity. All of these symptoms may disappear if the chemical irritation has been slight, only to reappear as the peritonitis develops. It also emphasizes the necessity of opening the abdomen when such symptoms have early been seen.

The diagnosis of perforative lesions, superinduced upon such an enteric infection, is most difficult, as this case illustrates, and only the smallest percentage of cases of typhoid perforations can be saved, even if the operation is performed at the earliest moment.

The percentage mortality demonstrated in military and civil surgery shows that if the perforative lesion of a hollow viscus is operated within the first six hours a recovery may be expected. After a longer elapsed time the percentage of recoveries rapidly falls.

In writing this paper I have had one thought in mind,—to emphasize the necessity of not waiting for the corroborative symptoms of hyperleucocytosis, increase in temperature and pulse rate and the obliteration of the liver dulness, but to consider the three important signs of sudden, acute pain, shock and muscular rigidity, and upon these to advise and do an immediate operation.

ERYTHEMA MULTIFORME BULLOSUM CAUSED BY ARSENIC. REPORT OF A CASE.

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Erythema multiforme is an acute inflammatory disease characterized by a reddish, macular-papular or nodular eruption, which may

rarely become vesicular or bullous. The individual lesions vary in size and shape. The onset is sudden, and it attacks the extremities as a rule, but may be more or less universal. The eruption is not markedly pruritic, is usually self-limited, and the cause has to be sought for with relentless diligence, for it is oftentimes very baffling. In the dermatological out-patient department at Carney Hospital, the disease crops up occasionally, especially at the present time, when the school children are being vaccinated in thousands. The macular-papular type of the disease is that most usually seen. The bullous type is not common. The following case presents an interesting etiological factor.

REPORT OF CASE.

M. R., female, aged 40 years, was admitted to Carney Hospital on June 7, 1922, in the service of Doctor Edward J. Denning, who referred the case to me. The patient presented an acute bullous eruption of the palmar and dorsal surfaces of the hands and fingers, and the plantar surfaces of the feet. She complained of itching and a feeling of tension and burning, but no pain.

The bullae varied in size from that of a pea to the dimension of a pigeon's egg. They were very tense and, from confluence, some were multi-locular. The skin, raised over the tense bullae, was pale and white. The eruption was confined to the parts mentioned. The contents of the bullae consisted of clear serum.

Nine days previously, on May 30, the patient had consulted a dental surgeon. A carious tooth was treated and an arsenical preparation was inserted in the tooth for the purpose of devitalizing the nerve of supply. Two days later, on June 1, she noticed that her hands and feet were slightly swollen and were itchy. On June 5, she consulted a physician and was given Fowler's solution, four minims thrice daily, after meals. After the fourth dose she fainted, for the first time in her life. On the same day, the bullous eruption suddenly appeared. She was admitted to Carney Hospital on June 7.

A general physical examination revealed a fairly good state of health, and an entire absence of past accidents, injuries, or operative procedures. Temperature on admission was 99.8°F. On June 13, 14, 15, 16, it rose to 101°F., but fell to normal on the latter date and remained normal for the remainder of her stay in hospital.

Pulse rate averaged 90 per minute up to June 16, when it became and remained normal.

Alimentary System: Beyond an injected condition of the gums, oral mucous membranes, fauces, and palate, and a chronic intestinal stasis associated with haemorrhoids, nothing abnormal was discovered.

Cardio-vascular System, normal.

Respiratory System, normal.

Genito-urinary System, normal.

Urine: 1025. acid, trace of albumen, no sugar, bile, blood, or pus. Color was amber. Microscopical examination showed a considerable number of leucocytes and squamous epithelial cells.

Teeth: Pyorrhoea about the lower centrals and laterals. An x-ray picture showed periodontal infection about roots of the upper right bicuspid.

Skin: Patient had a past history of eczema following the use of "Metol" used for photographic purposes.

TREATMENT.

Diet: Liquids, non-protein.

Internal Medication: High rectal enemas twice daily for the first week. Atropine sulphate, gr. 1/120 hypodermically at night. Magnesium sulphate, half an ounce twice daily.

External Treatment: The bullae were opened and the affected parts soaked in hot 1-5000 potassium permanganate for fifteen minutes twice daily, followed by crude coal tar. Crude coal tar, 1 part; zinc oxide, 1 part; cornstarch, 8 parts; petrolatum, 8 parts.

June 9, decided improvement followed the relief of tension consequent on opening the bullae and the local treatment just detailed.

June 14, the eruption had passed into a sub-acute stage associated with a denuded epidermis and a few outlying pea-sized bullae. Carbolic lotion 1-1000 now replaced the tar, the parts being kept moist with the application.

June 21, the eruption having practically disappeared, our purpose was now to get the hands and feet in a suitable state to travel, as the patient was due to sail for France in a few days. This was accomplished by means of alcoholic lotions.

July, recovery; discharged from hospital.

September 2, writing from Paris, the patient reports that she has had no further trouble, and that her hands and feet have completely recovered.

BENJAMIN FRANKLIN AS A MEDICAL CONTRIBUTOR.

It appears, according to the *Journal of the Florida Medical Association*, that in Franklin's day there was little or no medical literature in America; that in 1785 he invented bifocal lenses and a flexible catheter, and contributed to the treatment of nervous diseases by electricity. He wrote on deafness, gout, sleep, lead poisoning, heat in the blood, infection from dead bodies, death rate in infants, and medical education. He wrote a history of the Pennsylvania Hospital, of which he was the principal founder (1751). He also wrote a pamphlet on inoculation in smallpox.

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PNEUMONIA.

THE *Bulletin* of the Chicago School of Sanitary Instruction, issued by the Chicago Department of Health, warns of the imminence of the pneumonia season and announces that the Department Laboratories are prepared to furnish specific antigens for Types I, II, and III, and also a combined antigen for Group IV, to be administered subcutaneously for both prophylaxis and treatment of the disease.

Osler's Captain of the Men of Death has ridden triumphantly among us for many years, his toll of lives scarcely affected by the earnest attempts that have been made to unseat him. Now that the vanguard of his army is sending its scouts through crowded cities and scattered hamlets it may be well to take account of stock and see what are our most effective weapons of defense.

SPECIFIC TREATMENT.

Specific antigens or vaccines have seldom been proven of great value in the active treatment of acute infectious diseases. Pneumococcus vaccines for treatment and prevention have been experimented with largely, and their use often been advised, as is apparently being done this fall in Chicago, but strong proof of their efficacy in their present stage of development is still questionable. It is not our purpose to

discourage attempts in this still fruitful field, but it would be unwise to place too much reliance on an insufficiently tested weapon.

The Rockefeller Type I serum has been extensively used and has apparently met with considerable success in the treatment of favorable cases of this type of lobar pneumonia. Its use, however, even in the specific type, is limited, and some investigators entertain doubt as to its practical value. The secret of its success, where success has been attained, rests in its earliest possible administration, as with antitoxin. After the fourth or fifth day of the disease little benefit may be expected from its use. The case must be typed early, serum injected according to the Rockefeller technique, with due regard to the dangers of a preëxisting protein sensitization, and the dose must be repeated at frequent intervals as long as the temperature stays up, or until at least six doses have been given. As with all our biologic therapy or with our therapy in general, to a greater or less degree, the possibility of failure must be reckoned on.

Potent and effective sera have not yet been developed for Type II and III pneumonias, and Type IV forms a heterogeneous group that does not lend itself to specific antibody formation.

GENERAL TREATMENT.

The general treatment of pneumonia has been one of the duties of the practitioner since the day of Hippocrates, and but little need be said concerning it. Fresh air has been indicated in all respiratory diseases, but we believe that the use of cold fresh air may be abused. Zero temperature may be an ordeal difficult to endure, and we would make a plea for moderation in this respect. Fluid should be forced, nutrition maintained, and distention avoided; further treatment concerns the comfort of the patient, which can often be attained by the use of the head-rest, the chest swathe, and the judicious employment of sedatives and narcotics. Many men still make a routine practise of cardiac stimulation. In extremely dyspnoeic cases oxygen, by the Barach method or with the mouth tube, is a factor for comfort and may even turn the tide of life or death. Empyema must always be suspected with a prolonged temperature or increased respiratory embarrassment, but without increased discomfort the use of the needle may be cautiously delayed. Empyema, unless extreme, should not be operated on in the presence of pneumonia. The prognosis of streptococcus empyema is improved by closed drainage, as was strikingly shown in army experience.

PROPHYLAXIS.

Pneumonia is a specific contagious disease and suitable precautions should be observed.

The following reasonable suggestions are published in the Chicago *Bulletin*, previously mentioned:

"1. Be regular in your habits of living as to diet and proper rest.

"2. Avoid undue and prolonged exposure to wet and cold.

"3. Get as much exercise in the open air as you can.

"4. Dress so that you will feel comfortable in the house and equally as comfortable when out of doors in a lower temperature.

"5. Keep your living rooms at a temperature not exceeding 70 degrees. For people in normal health and properly clad, 68 degrees is better.

"6. Keep your feet dry and warm.

"7. Do not cough or sneeze in anyone's face or allow others to cough or sneeze in your immediate presence.

"By observing these suggestions you can greatly lessen your chances of 'catching' pneumonia and be more likely to get through the winter without needing the services of the undertaker."

POOR CALIFORNIA AND FORTUNATE WASHINGTON.

THE *Journal of the American Medical Association* commiserates California because its people "can have their backbones chiropractically analyzed and adjusted and their inflamed appendixes osteopathically rubbed to the point of rupture." The writer should have added that their cancers can be manipulated and stimulated to added activity, that children may die of diphtheria, that typhoid fever, smallpox and other communicable diseases may be spread and a host of other diseases with recognized pathology may progress, while the deluded unbelievers in scientific medicine are under the control of these inadequately educated practitioners. History has demonstrated these assertions.

In contrast, Washington is to be congratulated for the repeal of the law passed in 1921 which exempted school children from physical examination. The *Journal of the American Medical Association* reports that the objectionable statute was said to have been enacted as a result of the work of the Christian Scientists.

All honor to a state in which public sentiment has been developed to that degree of intelligence that makes possible the overthrow of ignorance and prejudice! Christian Science devotees should join forces with the Holy Rollers. They might then succeed in promoting greater sacrifices of human life.

A LAY EDITOR'S VIEW OF THE NOSTRUM EVIL.

Capper's Weekly, a Minnesota paper published by Senator Capper, has been publicly denounced by the Fairmont (Minnesota) *Daily Sentinel* as a paper claiming for its motto "A Champion of Human Welfare," but containing "column after column of the vilest, lowest, beastliest, most misleading, deceptive, dishonest and debauching advertisements of nostrums and alleged cures of diseases that are contained in any paper in the United States that is permitted to circulate through the mails."

It is encouraging to find lay editors who will come out boldly and say what they think about the type of fraudulent medical advertising that is still printed in so many publications. The American Medical Association is doing its best to protect the country against this sort of deceit. We welcome to the ranks all others who will aid in this much needed housecleaning.

DOCTORS AS SUCKERS.

One of the definitions of the word "sucker" found in Webster's Dictionary is "A person easily duped." Therefore, this opprobrious term may be used in English composition. Whether it may be applied to doctors may be open to debate, but it is a fact that physicians and clergymen are quite generally believed to be easy marks for unscrupulous vendors of stocks and often become the victims of schemers who hold out alluring promises of fabulous returns from alleged investments.

The inspiration for these remarks is found in a circular forwarded by a prominent member of the profession, with the suggestion that a brief discussion of the pitfalls prepared for the unwary may be in order. This circular is printed on good paper and sets forth that the recipient is invited by a board of directors to indicate his interest by signing a card which suggests that "You may favor me with details of this enterprise at your earliest convenience." Among the list of directors may be found the names of men with imposing scientific, business and literary titles and associations.

As usual, the advertised corporation has been formed for the purpose of manufacturing a product according to a process which places it at an advantage over all competitors. The implied suggestion is that investors in the stock will secure enormous profits.

We hope that those physicians with the gambling fever, who have been led to invest, will realize large returns, but we would like to suggest that in the future the rule should be adopted of making a careful analysis of opportunities for investment before parting with hard-earned money and never buy undeveloped prospects.

Too many young physicians put money into unsound enterprises with the hope of large profits. We contend that sick people should always consult expert advisers. In turn, physicians should consult business experts when they have money to invest. The speculators and plungers, as a rule, do not succeed financially. The man who puts his money in savings banks and government bonds will, ninety-nine cases out of a hundred, be better off when he reaches sixty years of age than the man who responds to alluring circulars. If one cares to go beyond absolutely safe investments let him go to a house with an established reputation for prudence and business sagacity. Even then, the man who invests in stocks is very fortunate if he never suffers loss. Finance is an intricate and complicated problem and some of its most brilliant exponents have suffered great reverses.

Our advice to the doctor is to play the financial game safe and spend energy on the practice of medicine, exercise business acumen in collecting accounts and invest only in recognized sound securities. Careful attention to the practice of medicine, coupled with industry, will almost invariably bring larger returns than speculation. Avoid the danger of loss with its attendant distracting anxiety. Do not enter the sucker class.

THE NEW PEDIATRIST.

Dr. L. Emmett Holt, president of the Child Health Organization of America, in addressing the American Child Hygiene Association last October sounds perhaps not a new, but an important note in stressing the need for a new type of pediatricist, one who knows not merely the diagnosis and treatment of the diseases of childhood, but the growth, development, and needs of the normal child, physical, mental, and educational.

Dr. Holt has emphasized the need of all time and happily the trend of the present time. Prevention is more important than treatment, and hygiene than pathology, and only by the understanding of the normal can we understand either. Herein lies the great failure of modern medical training, for the medical school teaches little but disease, and the hospital ministers only to the sick. This need is perhaps most keenly felt in Pediatrics, for Pediatrics should be essentially the prevention of disease and the regulation of normal development.

How much does the interne, freshly graduated from a Pediatrics Hospital service know about the minutiae of normal maternal nursing? The use of protein milk in acute indigestion with diarrhoea he is thoroughly familiar with, as he is with the interpretation of serum protein concentration and the indication for in-

travenous glucose. Should my boy play football? Will rowing injure his heart? Such questions are undoubtedly often asked and presumably always answered, but on what real knowledge of facts are the answers based? These questions may sound trivial, but they serve to exemplify the position in which the embryonic scientific pediatrician will find himself some day.

A BETTER CHANCE FOR THE BABIES

The Metropolitan Life Insurance Company's Statistical Bulletin for October points out that the first month is the most dangerous period of life. It is easier to survive a year at the age of 65 than for an infant to live through its first month. In the United States each year over 105,000 babies die before they are a month old. Infant mortality after the first month has been cut in half by better infant care, but that during the first month has been little affected. That this can be greatly improved has been shown in experimental groups. The obvious methods are better prenatal care, reducing the number of premature and still births, better obstetrics, and better care during the entire puerperium.

CHOLERA IN THE PHILIPPINES.

Epidemic and endemic cholera in the Philippines, according to L. Lopez Rizal, Philippine Health Service, in the Monthly Bulletin of the Philippine Health Service for June, 1922, is due to vibrio carriers. It has been found that the vibrio may persist for years in man, during which period it undergoes changes as to its agglutinability.

The problem of disinfecting carriers has not been solved and is a task to which the Health Service has set itself.

SMALLPOX IN THE PHILIPPINES.

Smallpox has never disappeared from the Philippines, but its incidence has been greatly checked since compulsory vaccination was begun years ago. Its persistence in endemic form and the epidemics of 1918 and 1919 are due to the difficulty, with a small force and an insufficient appropriation, of adequately vaccinating the provincial population, and especially the large mass of shifting population. A more determined effort is now being made to vaccinate the small children, believing that in this way an immune population can eventually be secured.

DR. ARTHUR A. LAWRENCE SUSPECTED OF ILLEGAL PRACTICES.

The *Boston Post* has published an account of the alleged detection of a faro fraud in which it is also alleged that Dr. Arthur A. Lawrence is an accessory in association with James Yearley of Detroit. Some time ago a woman was treated in the Boston City Hospital for conditions following an abortion. This woman stated that the abortion was performed by Dr. Lawrence, but when the case was brought before the Board of Registration in Medicine she declined to identify Dr. Lawrence as the one responsible for her condition. Subsequently a woman investigator testified before the Board that Lawrence had agreed to perform an abortion. This was construed as unprofessional conduct. After many delays secured by attorneys the Board on April 18, 1922, suspended the license of Lawrence for one year.

One attorney for Lawrence developed animosity toward the Board during these procedures, and attempted to secure legislation designed to inhibit the powers of the Board, but did not secure sufficient support for his recommendations.

If the guilty association of Lawrence with law breakers is demonstrated it will be confirmatory evidence of that quality of mind which leads a man to enter upon a criminal life for the purpose of winning a money stake and will give to that Board evidence which would warrant permanent revocation of his registration as a physician.

The faro game may be more dangerous for a criminal than gambling in connection with maternal and foetal life.

News Notes.

NEW OFFICERS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION.—At the last annual meeting the following officers for the year 1922-1923 were elected: President, E. C. Levy of Richmond, Va.; executive secretary, A. W. Hedrich of New York; treasurer, Roger I. Lee of Cambridge, Mass.

SOMETHING BOSTON WILL NEVER HAVE—AN EIGHTEEN-STORY HOSPITAL BUILDING.—On November 5 the corner-stone of the new Beth Israel Hospital, New York City, was laid. This structure is to be the tallest hospital building in the world, with four floors below the street level and fourteen floors above. It will be the last word in hospital design and construction, accommodating easily patients demanding every specialist's care—and all in a ground space of 123 by 184 feet!

DEATH RATE IN BOSTON.—During the week ending November 25, 1922, the number of deaths reported was 226, against 212 last year, with a rate of 15.43. There were 33 deaths under one year of age, against 32 last year. The number of cases of principal reportable diseases were: Diphtheria, 70; Scarlet Fever, 55; Measles, 45; Whooping Cough, 62; Typhoid Fever, 4; Tuberculosis, 39. Included in the above, were the following cases of non-residents: Diphtheria, 8; Scarlet Fever, 10; Typhoid Fever, 2; Tuberculosis, 6. Total deaths from these diseases were: Diphtheria, 4; Scarlet Fever, 1; Whooping Cough, 4; Tuberculosis, 12. Included in the above, were the following cases of non-residents: Scarlet Fever, 1.

PITTSFIELD NEWS.—Dr. B. W. Paddock of Pittsfield is away on his vacation, which he is spending in the New Brunswick woods. He expects to be back at work December 1.

Dr. J. B. Thomes has just resumed practice after a three weeks' vacation in Maine, where he was very successful in hunting.

Dr. J. A. Sullivan of Pittsfield is enjoying a 3 months' tour of Europe.

Dr. W. Carleton Warriek, formerly of Detroit, Michigan, has located in Pittsfield, where he will look after the practice of Dr. F. A. Roberts while the latter is spending his honeymoon on a Caribbean cruise.

A. P. MERRILL.

A WELL MERITED AWARD.—Dr. W. B. Cannon, Professor of Physiology in the Harvard Medical School, has been awarded a distinguished service medal citation for his work overseas. Dr. Cannon holds a commission of Colonel in the Medical Officers' Reserve Corps. He has been connected with the Harvard Medical School since 1892 and was appointed Higginson Professor of Physiology in 1906. He is a recognized authority in his chosen field. He has written many papers and has given freely of his time in aiding movements inaugurated for the instruction of the public on matters of public health.

His name will always be associated with the introduction of the x-ray method of studying the gastro-intestinal movements, the investigations on adrenal glands, and more recently with the scientific interpretation of the phenomena of shock and its rational treatment. As a teacher of physiology his position is pre-eminent.

TOUR DE LUXE TO A. M. A. MEETING. SAN FRANCISCO, 1923.

The Medical Society of the State of New York is busy arranging a tour to the A. M. A. session at San Francisco, June, 1923.

Our President, Arthur W. Booth, M.D., cordially invites all the Delegates and Fellows from the Eastern States who are planning to attend the session, together with their wives, sweethearts, and friends, to join this tour to California and the Canadian Rockies.

Our train de luxe leaves New York Thursday, June 14, 6:00 P.M., arriving in Chicago 3:00 P.M., Friday, where we will enjoy a drive over the Lake Shore and Boulevard System; our train is transferred to the Santa Fe System and we leave at 6:00 P.M.

In Kansas City we have another delightful drive the following morning.

Our next stops are to be Colorado Springs, Albuquerque, Grand Canyon, San Bernardino, with auto drive through Redland, Smiley Heights and Riverside, then to Los Angeles.

Next Santa Barbara, Del Monte, Santa Cruz and the Big Trees, arriving at San Francisco early Monday morning, June 25.

We leave San Francisco, Friday, June 29, 10:00 P.M., stopping at Shasta Springs, Portland, Rainier National Park, Columbia River and Seattle.

We have a day's boat sail up Puget Sound to Victoria and Vancouver, with drive in both cities, after which we take our train and continue through the beautiful Canadian Rockies, stopping at Lake Louise and Banff.

Then on to St. Paul, Chicago and home by the Broadway Limited, arriving in New York, Thursday, July 11, 9:40 A.M.

This tour has everything attended to, and the price will be lower than any individual can obtain.

The luxury and freedom from detail and cares, with the opportunity to make friendships will be appreciated by all.

Our special train will be waiting for us at every stop, autos, baggage transfer and hotels, attended to everywhere except at San Francisco, where the Fellows will probably want to go where their section is located.

To insure accommodations in the best hotels en route we must have one hundred reservations by December 30.

All inquiries are to be sent to Malcolm C. Rice, M.D., Chairman of Committee, 152 West 42nd Street, New York City.

THE COMMUNITY HEALTH ASSOCIATION.

The suggestion has been made that the Instructive District Nursing Association and the Baby Hygiene Association should be combined under the title of the Community Health Association.

This is in the form of a recommendation to the members of the corporations.

Mr. William A. Dupee has been chosen as the head of this association; Mrs. E. A. Codman and Dr. Richard M. Smith as the vice-presidents; Mrs. Morton P. Prince as secretary; and Ingersoll Bowditch and Charles E. Spencer as the treasurers.

The directors are Robert Amory, Miss Mary A. Barr, Miss Esther G. Barrows, Dr. Alice F. Blood, Mrs. J. Gardner Bradley, Mrs. Philip S. Dalton, Miss Emily G. Denny, Mrs. Robert L. DeNormandie, William Ellery, Miss Lina H. Frankenstein, Mrs. L. Cushing Goodhue, Mrs. John L. Grandin, Mrs. N. Penrose Hallowell, Dr. Alice Hamilton, Mrs. John C. Hunt, Mrs. Carl T. Keller, Mrs. James Lawrence, Charles E. Mason, Dr. Francis X. Mahoney, Mrs. Frank H. Monks, Dr. Robert B. Osgood, Mrs. Francis W. Peabody, Miss Gertrude W. Peabody, James J. Phelan, Dr. Stephen Rushmore, Mrs. Richard P. Strong and Felix Vorenberg.

Miss Mary Beard, formerly in charge of the Instructive District Nursing Association, will be the general director. Miss Rand will direct child hygiene and Miss McCann the home visiting department.

HOSPITAL HONORS THIS COUNTRY'S FIRST TRAINED NURSE.



Miss Linda Richards was the guest of honor at the New England Hospital for Women and Children, at Boston, Mass., during the fiftieth anniversary of its training school and the sixtieth anniversary of the founding of the hospital itself. Miss Richards was the first woman to be graduated from this school and at the same time the first trained nurse in the United States.

Miss Richards upon graduation was called to the Bellevue Hospital, N. Y. City, where she became Assistant to Sister Helen, the English nurse who organized it. From there she returned to Boston to organize the training school of the Massachusetts General Hospital, later performing the same service at the Boston City Hospital.

BEQUESTS TO HOSPITALS.

By the death of the widow of Arthur F. Estabrook the provisions of the will of Mr. Estabrook become operative, and the following named institutions, among others, will profit by legacies: To the Massachusetts Homeopathic Hospital, \$100,000; the Children's Hospital, Boston, \$10,000; the Boston Floating Hospital, \$10,000; the Eye and Ear Infirmary, \$10,000; Massachusetts Association for Promoting the Interests of the Adult Blind, \$10,000.

Miscellany.

OPINIONS OF AMERICAN STATESMEN ON EDUCATION.

THE good education of youth has been esteemed by wise men in all ages as the surest foundation of the happiness both of private families and of commonwealths.—*Benjamin Franklin.*

Promote, then, as an object of primary importance, institutions for the general diffusion of knowledge. In proportion as the structure of a government gives force to public opinion, it is essential that public opinion should be enlightened.—*George Washington.*

Wise and judicious modes of education, patronized and supported by communities, will draw together the sons of the rich and the poor, among whom it makes no distinction; it will cultivate the natural genius, elevate the soul, excite laudable emulation to excel in knowledge, piety and benevolence; and, finally, it will reward its patrons and benefactors by shedding its benign influence on the public mind.—*John Adams.*

A system of general instruction which shall reach every description of our citizens from the richest to the poorest, as it was the earliest, so will it be the latest of all the public concerns in which I shall permit myself to take an interest.—*Thomas Jefferson.*

DEATH RATES, 1921.

THE Department of Commerce announces that the compilations made by the Bureau of the Census indicate that 1921 was a remarkably healthful year. Record low death rates appear for nearly all areas. The lowest state rate (8.2) is shown for Montana, and the highest (14.2) for Vermont. For cities which at the last census had populations of 100,000 or more, the lowest rate (7.5) is shown for Akron, and the highest (17.4) for Memphis.

SHINGLES AND CHICKEN-POX.

MANY writers have noted an interesting concurrence of herpes zoster and varicella, and have attempted to link the two together as different forms of the same disease, according to C. Eugene Riggs, in *Minnesota Medicine*. According to the theory of some, the organism is the same for both diseases, but blood-borne in the case of varicella, in the spinal fluid in the case of herpes. Instances of chronological relationship between the two are of course not wanting; but is this more than coincidence?

The evidence so far seems insufficient.

NEW AND NON-OFFICIAL REMEDIES.

DURING November the following articles have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Non-Official Remedies:

Lederle Antitoxin Laboratories: Mercurialized Serum-Lederle for Intravenous Use.

Charles Leitch & Co.: Sulfarsenol.

Mallinckrodt Chemical Works: Barium Sulfate Pure. M. C. W.

H. A. Metz Laboratories: Benzozol.

Parke, Davis & Co.: Silvol.

Arsenobenzol-Dermatological Research Laboratories and Arsphenamine-Dermatological Research Laboratories: These products are now marketed by the Abbott Laboratories as Nearsphenamine-D. R. L. and Arsphenamine-D. R. L. The Council has continued the acceptance for New and Non-Official Remedies under these names.

PUBLIC HEALTH REPORTS (UNITED STATES PUBLIC HEALTH SERVICE) NOVEMBER 3 1922.

VACCINATION OF MONKEYS AGAINST PNEUMOCOCCUS TYPE I PNEUMONIA BY MEANS OF INTRATRACHEAL INJECTION OF PNEUMOCOCCUS TYPE I VACCINE. (CECIL AND SEFFEN.)

THE intratracheal injection of pneumococcus vaccine affords just as satisfactory an immunity against pneumonia as that induced by subcutaneous or intravenous injections. This method of vaccination with three doses of Type I vaccine renders monkeys completely immune against experimental pneumococcus Type I pneumonia. The mere spraying of the throat with pneumococcus vaccine will not produce complete immunity against pneumonia in monkeys. The immunity established by intratracheal injection of pneumococcus vaccine is probably cellular in character, since little or no protective substance against pneumococcus can be demonstrated in the serum of monkeys thus vaccinated.

AMERICAN RELIEF ADMINISTRATION.

Moscow.—Flying detachments of Russian physicians to administer salvarsan to sufferers from recurrent typhus, which is increasing with the coming of winter, is the latest emergency disease prevention step taken by the medical department of the American Relief Administration in the district of Rostov-on-Don, according to Dr. Henry W. Beeuwkes, chief or the A. R. A. medical division in Russia.

These "flying detachments" are equipped to administer the salvarsan to fever sufferers in their homes. It has been found that salvarsan is an effective aid in the breaking up of recurrent fever. This disease has increased throughout Russia due to the wet and cold weather.

The A. R. A. medical representative at Rostov reports that sanitary and other health conditions are much improved in Rostov over a year ago.

Information just received at headquarters here from Minsk announces that a surgical hospital at the big refugee camp at Kozreva opened on October 15th.

Asiatic cholera, one of the most fatal of epidemic diseases, has been so successfully combated in Russia by a wholesale inoculation of the population that in the Volga basin and the districts of Orenburg and Ufa, where in 1921 there were 93,784 recorded cases of the disease, this summer saw only 5,386 cases, a decrease of more than 94 per cent. for that area.

It was in this region that the inoculation campaign waged by the American Relief Administration was most intensive. In the Ukraine, where operations started later, and where the inoculations were less frequent, the cholera cases increased, but the falling off in the Volga areas more than offset this increase in the Ukraine and the records show for the summer of 1922 only 67,512 cases of cholera in all Russia (including the Ukraine) as compared with 176,885 cases in the summer of 1921. This is a decrease of more than 61 per cent.

DEPARTMENT OF COMMERCE, WASHINGTON.

MORTALITY FROM CANCER, 1921.

Washington, D. C., November 14, 1922.—The Department of Commerce announces that the returns compiled by the Bureau of the Census show that over seventy-six thousand deaths were due to cancer in the death registration area of the United States in 1921; and assuming that the rest of the United States had as many deaths from this cause in proportion to the population, the total number of deaths from cancer in the entire United States for 1921 was

93,000, while for 1920 the number is estimated as 89,000, or 4,000 less than for 1921.

The trend of the cancer death rate is upward, the rate for 1921 being higher than that for any earlier year in 23 of the 34 states for which rates are shown. The cancer death rate in the registration area in 1921 was 86 per 100,000 population, against 83.4 for 1920. In comparing the death rate from cancer in one state with that in another, the Bureau uses "adjusted" rates in order to make allowance for differences in the age and the sex distribution of the population, because, generally speaking, only persons in middle life and old age have cancer, so that a state with many old persons may be expected to have more deaths from cancer than a state with comparatively few old persons.

The highest "adjusted" cancer rate for 1921 is 99.6 per 100,000 population for the state of Massachusetts, and the lowest is 47.6 for the state of South Carolina.

For a few states adjusted rates have been calculated separately for the white and colored population. In this group of states the highest adjusted cancer rate for the white population is 95.9 per 100,000 population for New York, and the highest rate for the colored population is 90.6, also for New York. The lowest adjusted cancer rate for the white population is 51.5 for Tennessee, and the lowest for the colored population is 36.4 for Florida.

Summarized briefly, the adjusted rates show that the Northern states have comparatively high and the Southern states comparatively low cancer mortality, while there is little difference between the adjusted cancer rates of the white and colored races of the same states. In other words, the white and colored races seem equally susceptible to cancer, but both races seem less susceptible in the South than in the North.

MALNUTRITION AND SCHOOL FEEDING.

Bulletin, 1921, No. 37, of the Bureau of Education of the Department of the Interior, on Malnutrition and School Feeding, shows interestingly and convincingly the need of proper food and nutritional training for school children, and the benefit that is derived from their provision.

Malnutrition has so far been most extensively studied in Great Britain. The grading of nutritional defects has been difficult, but a practical working method, the "Dunfermline Scale," has been devised by Dr. Alister MacKenzie, of Dunfermline, Scotland. According to this scale all children are divided into four groups, as follows:

- (1) "Excellent" means the nutrition of a healthy child of good social standing.
- (2) Children whose nutrition just falls short of this standard are "good."

(3) Children "requiring supervision" are on the border line of serious impairment.

(4) Children "requiring medical treatment" are those whose nutrition is seriously impaired.

Without a uniform method of diagnosis, however, there is naturally a great disparity in the statistics of malnutrition, estimates of its prevalence running from 1 to 50 per cent. of the school population in communities otherwise similar. The chief causes of malnutrition are given as poverty, ignorance, and disease, malnutrition existing in inverse proportion to the family incomes.

School feeding in France antedated that in England, but it has reached the height of its development in the latter country, the Boer War being largely responsible for bringing the issue to the front. In December, 1906, the education (provision of meals) act was passed by Parliament, the act being predicated on the theory that no child should be deprived of the full value of his education because of lack of food.

Philadelphia is responsible for the inception of the school feeding idea in this country, the first penny lunch having been started in that city in 1898. Since then most of the larger cities have adopted it. Chicago at present has the most intensive school lunch system in America. Boston for years made no provision for lunches in the elementary schools, this task being finally taken on during the war by a voluntary committee as part of the food-conservation work. The high school lunches in this city, however, administered by the Women's Educational and Industrial Union, compare favorably with those of any city in the country.

Dr. William R. P. Emerson, of Boston, contributed the first constructive work in attacking defective nutrition by organizing his nutrition clinics and classes. It is through this work, through instructing children in social hygiene and the values of diets, that the best results will come, and not from the merely temporary provision of such food.

SUBCUTANEOUS ETHER IN PERTUSSIS.

Rocco Mancinelli, in *La Pediatra*, September 1, 1922, p. 801, reports satisfactory results from the subcutaneous injection of ether in whooping cough.

One c.c. was used in the first year of life, 1½ c.c. in the second year, and 3 c.c. in the third year. Injections were given every other day, the number varying from 5 to 10. Marked improvement was found in 38 out of 61 cases.

GROUPING OF MENINGOCOCCUS STRAINS.

The United States Public Health Service is working on the serological grouping of meningococcus strains. As is well known, there are a

larger number of strains of meningococci, differentiated on both their tropin and agglutinin reactions. The problem is to develop a polyvalent serum that will combat the common pathogenic strains, and each year it is necessary to add new strains and eliminate old ones. The organism causing a case of meningococcus meningitis should be cultured and agglutinated with known sera in order that a potent serum may be used for treatment.

Obituary.

JOHN WASHBURN PRATT, M.D.

Dr. John W. Pratt, Resident Physician to the Massachusetts General Hospital from 1886 to 1897, died at his home in Dedham, November 17, 1922, from pneumonia.

He was the son of Dr. Calvin Barton Pratt of Bridgewater, where he was born, February 9, 1854. His brother, Dr. Calvin Pratt, long a practitioner of that town, died there at the age of eighty last June, as noted in the *Journal*. John attended Exeter Academy, spent a year at the Massachusetts Institute of Technology, and took the degree of Ph.G. at the Massachusetts College of Pharmacy in 1877. Entering Harvard Medical School, he served as surgical house officer at the Massachusetts General Hospital during the latter part of his course, and on graduating in 1886 became resident physician. In 1897 he began private practice in Dedham, where he served as Associate Medical Examiner of the first Norfolk District, physician to the Norfolk County Jail and to the Dedham House of Correction. For several years he was secretary of the Dedham Board of Health.

He is survived by his widow, Mrs. Marion E. Pratt, a son and a daughter.

RECENT DEATHS.

DR. JOEL FRANK TRULL, founder of the Trull Hospital of thirty-five beds, in Biddeford, Maine, in 1901, has died in that city, following a stroke of paralysis. The end came on November 22, 1922, when he was fifty-four years old. He was a graduate of Boston University School of Medicine (Homeopathic) in 1894 and had long been a prominent practitioner in Biddeford.

DR. FLAVEL SHURTLEFF THOMAS died in South Hanson, November 26, 1922, at the age of seventy. He was born in that town September 7, 1852, the son of Isaac and Abbie Shurtleff Thomas; attended Hanover Academy and Phillips Andover Academy and Harvard Medical School, where he took an M. D. in 1874. Subsequently he received the degrees of S. B. from Syracuse University (N. Y.) in 1885; S. M. from the same source in 1886, and D. V. S. from McGill in 1890. He joined the Massachusetts Medical Society in 1875 and resigned in 1888. Dr. Thomas married Caroline M. Smith, daughter of Capt. Joseph Smith of Hanson, a veteran of the Civil War, and is survived by her and by a son and daughter. He was

a member of Puritan Lodge, A. F. and A. M., of Whitman; Pilgrim Royal Arch Chapter and Old Colony Commandery, Knights Templar, of Abington; North River Lodge, I. O. O. F., of Hanover, and also a member of the Hatherly Medical Club.

DR. EVERETT THORNTON NEALEY, of Bangor, Maine, died in Grace Hospital in that city, November 26, 1922, of pernicious anemia and nephritis, at the age of sixty-four. He was a graduate of Bowdoin Medical School in 1883, was a member of the Maine Medical Association and the American Medical Association. He had served on the staff of the Eastern Maine General Hospital and was physician to the Bangor and Aroostook Railroad, and for many years county medical examiner. He was one of the first physicians in the city to take up x-ray work. His widow, who was Helen Coombs, and two sons survive him.

DR. CHARLES HERMAN MILLER died at his home in Ashmont, Dorchester, November 23, 1922, at the age of 59. He was a graduate of New York University Medical College in 1891, a member of the American Medical Association and the Massachusetts Medical Society, making a specialty of otology, laryngology and rhinology.

Correspondence.

CANCER WEEK.

(From Our Maine Correspondent.)

Mr. Editor:

The State of Maine during the past two years has instituted and carried on a very active and aggressive campaign for the control of cancer, and it may be of some value for those interested in this subject in other States to know some of the details of Maine's plan of campaign and to learn how practically every adult in a State made up largely of scattered rural communities has had the essential and hopeful facts about cancer placed before him in the last two years.

Cancer control work is under the joint supervision of the Maine Medical Association, with a committee of three, and the Maine Public Health Association, with a very much diversified committee of nine; this committee being represented by the secretary of the State Federation of Labor, the State Commissioner of Health, the president of the State Federation of Women's Clubs, the secretary of the Maine Graduate Nurses' Association, the head of the Maine State Grange, and the executive secretary of the Maine Public Health Association, besides the three members of the State Medical Association's committee, the chairmanship of both committees residing in the same man.

In addition to these two very active committees, a county chairman has been appointed in each county of the State to carry on the work with the aid of a sub-committee in each individual county.

Maine is a State of few large cities and, in order to solve the problem of furnishing adequate speakers on this important subject, to avoid the necessity of a few able speakers giving up much time and traveling long distances to cover a wide field, and also in order to provide information which should be uniform in character and voice the consensus of opinion of many authorities on the subject rather than giving the chance for the expression of the more limited opinion of any one man, the committee prepared a carefully worded, non-technical, standard lecture which was sent to every physician in the State together with a letter stating the object of the campaign, the manner in which it was desired to place this lecture before audiences, and asking for co-operation.

The response to this scheme was most gratifying. Many physicians who would hesitate to prepare a talk themselves willingly read the standard lecture many times before numerous audiences, both during the National Cancer Week and throughout the winter. This scheme solved a large problem in this State.

And, further, in order that the physician might be spared the necessity of seeking an audience himself, the heads of the State Federation of Labor, State Grange, State Federation of Women's Clubs, State Nurses' Association, and many other social, church, and fraternal organizations, were asked to notify their various sub-divisions of the nation-wide educational campaign and to request that a special meeting be arranged at which some local physician should be asked to read the standard lecture.

Our committee received immediate and most enthusiastic and efficient response to this appeal, and so thoroughly was this scheme carried out throughout the whole State that we are most gratified to learn that a large percentage of the adult population of the State was reached in this way.

In addition to what the doctors have done themselves, in many sections of the State the doctors' wives, after being properly coached in the matter of answering questions which might arise regarding the lecture matter, have gone before small groups in the churches, normal schools, etc., and read the lecture, thus increasing the number of people reached.

Another feature of the campaign which was of distinct value was the distribution by means of the rural free delivery of carefully prepared literature to those in the more remote rural districts and outlying farm areas who could not be reached by the lecture system. Copies of this literature were translated into French and distributed to the large French population in many communities.

In this way, through the efficiency of committees representing widely diversified groups of people, and the hearty co-operation of the medical profession of the State practically as a whole, a vastly greater number of people have had the vital facts about cancer placed before them than probably could have been done in any other way in a State of this kind.

One or more papers on the general subject of malignant disease have been read before each county medical society and a lecture or talk has been given to every nurse in training in every public and private hospital throughout the State, thus rounding out the proposed plan to reach every possible group of people.

This scheme was inaugurated and well under way before the National Cancer Week, it was intensified during this week, and it is proposed to carry it on without a let-up throughout the entire winter as was done last year. It is believed that a campaign of this order should be pushed with as much vigor and over as long a period as that against tuberculosis in order to accomplish the desired result, but it is quite evident that even the effort so far made has brought about small, but nevertheless very unmistakable, results as evidenced by the awakened interest in the subject shown by the medical profession throughout the State and by the increasing number of people seeking advice about conditions about which they are uncertain.

It is believed even further that the time has already arrived when efforts for prophylaxis against cancer should be systematically made, and it has been proposed by the chairman of the cancer control committee that "observation clinics" be established in the three larger hospitals of the State to which the profession can send doubtful cases for diagnosis, in which the inoperable case can receive proper x-ray or radium palliative treatment, and in which as large a number of patients as possible, especially women, shall be kept under observation

for a period of five to ten years in order to detect the possible early onset of malignancy or the treatment of definitely pre-cancerous conditions. Such a clinic can be run as an out-patient clinic and, if cases are properly catalogued and an adequate follow-up system instituted, there should be no difficulty in following cases and obtaining valuable results along the line of prophylaxis.

The health authorities of the State of Maine are trying to teach its people that the seeking of early advice from competent authorities in all matters of bodily abnormalities is the surest road to health and happiness and a long and useful life.

EDW. H. RISLEY, M.D.

Waterville, Me.

INFECTIOUS JAUNDICE.

New Haven, Conn., Nov. 24, 1922.

Mr. Editor:

The undersigned is desirous of obtaining information regarding the prevalence of Infectious Jaundice in your State.

The disease is non-reportable and information regarding its prevalence cannot therefore be obtained from Boards of Health.

I shall be grateful for any reports of outbreaks which your readers may care to send me.

GEORGE BLUMER, M.D.

[NOTE: In the interest of scientific medicine practitioners should unite with students of medical problems and forward information to those who are studying any form of disease. Massachusetts physicians should give all possible assistance to Dr. Blumer.—Editor.]

THE SCHOOL INSPECTION AND THE FAMILY PHYSICIAN.

Malden, November 24, 1922.

Mr. Editor:

With the development of school inspection we hear a good deal about the necessity of co-operation between the school medical personnel and the family physician which is, of course, highly desirable.

Unfortunately, my own experience in this regard has been very deplorable. I presume this was the experience of many practitioners. The school nurse very rarely, to say the least, takes the pains to find out whether the child supposed to be sick has a family physician and to get in touch with him. She usually undertakes to treat the patient herself or refer it to some charitable medical institution, no matter whether the patient is rich or poor.

With such an abnormal state of affairs, I think something must be done to correct this evil. No co-operation can exist between two parties when one is entirely ignored by the other.

Different medical societies ought to act upon it in their respective communities and see that this evil should be corrected.

Respectfully,

LOUIS SILVER.

THE ADDITION TO THE GARDNER STATE COLONY.

Mr. Editor:

Your letter of November 20 to the Department of Mental Diseases has been referred to me for reply.

This institution caring for the insane was developed and is developing with two ideas in mind: The Colony plan with fairly widely detached buildings, and occupation used as means of treatment. At the present moment 95% of our patients are occupied every day. During the early years of the institution cases were admitted only by transfer by the

Department of Mental Diseases, but for the past five years we have been a receiving hospital, receiving cases by voluntary application and by commitment from the community the same way as other state hospitals admit. Our census is now approximately 900, including those 50 in our family care system who are placed out in families.

The new hospital building now under construction is a fire-proof building, two stories and finished basement. The basement will provide an x-ray room, laboratory, dental room, dispensary, diet kitchen, continuous bath treatment room, lecture room for nurses, and various utility rooms. On the first floor are both single rooms and dormitories for medical and surgical cases for women. This provides for thirty-eight on this floor. There is also on this floor a suite for sick employees separate from the rest of the floor. On the second floor is an operating room, sterilizing room, ether and recovery room, observation room for nurses off the operating room. This floor will care for thirty-eight medical and surgical cases. Our consulting surgeon is A. F. Lowell, M. D., of Gardner, Mass. Plans for this building can be seen at the office of Curtis W. Bixby, Architect, 8 Beacon St., Boston, Mass.

We have also under construction this year, by our own labor, a new laundry building which will care for 1500 patients and employees. We are also constructing a subway to connect all of our main buildings, the total cost of which, when properly equipped, will be \$1600.

I am sending, under separate cover, a copy of our last annual report.

Very truly yours,

CHAS. E. THOMPSON,
Superintendent.

INTERNATIONAL CONVENTION OF INDIVIDUAL-PSYCHOLOGY.

Brooklyn, November 14, 1922.

Mr. Editor:

I have been authorized to inform you that an International Convention of Individual-Psychology will be held in Munich (Germany), on December 8, 9 and 10.

The program of the first day consists of a discussion of "Individual Psychology and a general outlook of the happenings in the world." (Individual-Psychologie und Weltanschauung.)

Then Dr. Alfred Adler of Vienna will deliver a very interesting lecture.

Also Professor Dr. D. E. Oppenheim of Vienna is going to speak of "Shakespeare's Knowledge of Human Nature."

Dr. Sumpf, Munich (Germany), Knollbachstrasse 75/3, will be glad to answer any questions that anybody may have in regard to the convention and will make all reservations for those who plan to attend.

If you want further information about the Individual-Psychology I am in a position to obtain the work of one of America's famous professors on this subject.

I would thank you to take note of the above and remain,

Very truly yours,

(Signed) RICHARD KRAUSS,
c/o MR. ALEX. MARTINEK,
6813 4th Ave., Brooklyn, N. Y.

NEW ENGLAND DERMATOLOGICAL SOCIETY.

The regular quarterly meeting of the New England Dermatological Society will be held at the Boston City Hospital, in the Surgical Amphitheatre, on December 13, 1922, at three thirty p.m. All physicians who are interested are invited to attend.

HIC JACET.

In golden pre-Vesalian days
The barbers cut for stone,
And to the wondering yokels' gaze
A pebble (palmed) was shown.

Then simples, leaves, and herbs were brewed
And incantations spelled,
And by the force of magic rade
Black devils were expelled.

The ages with their noiseless tread
Moved silently along,
And some were purged and some were bled
Both copiously and long.

Then to the much enduring world
Came an enlightened day—
The bloody Moloch's flag was furled—
The cultists held their sway.

As water rushes from the spout
Our flood of knowledge grew,
And old ideas took hasty rout
Besieged by the new.

And still man's wisdom grew apace
As modern history shows—
Metallic tractors joined the race
And Mother Eddy rose.

Then maladjustments held the floor,
But there—enough's been said;
Why flaunt the vivid flag before
The angry Holstein's head?

Amid the fair Elysian fields
The gentle Coué roams;
To mild persuasion cancer yields;
Health broods above our homes.

Now Science truly has the laugh
On all that Hell can send,
For Father Abrams holds the staff—
And "Finis" can be penned.

Joe.

MORTALITY IN MASSACHUSETTS.

Mortality from the following causes in Massachusetts for the first six months of 1922, from statistics compiled by the Registrar of Vital Statistics:

Typhoid fever	25
Measles	101
Scarlet fever	103
Whooping cough	103
Diphtheria and croup	276
Influenza	487
Poliomyelitis	5
Tuberculosis of the lung	1740
All other forms of tuberculosis	313

(2053—105.2 annual rate per 100,000 population.)

Cancer	2334
(119.6 annual rate per 100,000 population.)	
Alcoholism	104
Meningitis	125
Cerebral hemorrhage	2305
Pericarditis, acute endocarditis and myocarditis, angina pectoris, other diseases of the heart	4741
(243.0 annual rate per 100,000 population.)	
Bronchopneumonia	2017
Pneumonia	1608
Diarrhea and enteritis (under two years)	324
Puerperal fever	94
Other puerperal affections	230
Congenital debility and malformations	1882
Violent deaths (excluding suicide, homicide, and automobile accidents)	958
Automobile accidents and injuries	198

Suicide	234
Homicide	50
These rates are based on an estimated population, 3,902,576, as of July 1, 1922.	

BOARD OF REGISTRATION IN MEDICINE.

EXAMINATION HELD SEPT. 12, 13, 14, 1922.

Applicants Examined	57
Applicants Registered	28
Applicants Rejected	29
Detail of College of Graduation as follows:	
Middlesex College of Med. & Surg.	13
St. Louis Coll. Phys. & Surg.	7
Tufts College Medical School	6
Mass. College of Osteopathy	5
Phys. & Surg., Boston	3
Harvard Medical School	3
University of Vermont	2
Chicago Coll. Osteopathy	2
Imperial Ottoman	1
Kansas City Phys. & Surg.	1
Bowdoin	1
Johns Hopkins	1
Woman's Med. Coll. of Pa.	1
Hahnemann, Pa.	1
Washington Univ., St. Louis	1
Boston Univ. School of Medicine	1
Yale Medical College	1
Univ. West Tennessee	1
Univ. Naples	1
Laval	1
Kansas City Univ.	1
Univ. of Kansas	1
Phys. & Surg., Baltimore	1
Chicago Coll. Medicine & Surgery	1

Total

The College of Graduation of rejected applicants is as follows:

Middlesex Coll. Medicine & Surgery	8
St. Louis Coll. Phys. & Surg.	5
Mass. College of Osteopathy	4
Phys. & Surg., Boston	2
Tufts College Medical School	2
Imperial Ottoman	1
Kansas City Phys. & Surg.	1
Washington Univ., St. Louis	1
Univ. West Tennessee	1
University Naples	1
Laval	1
Kansas City University	1
Phys. & Surg., Baltimore	1

Total

DISEASES REPORTED TO MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH.

WEEK ENDING NOVEMBER 18, 1922.

Disease.	Cases.	Disease.	Cases.
Anterior poliomyelitis	4	Ophthalmia neonatorum	14
Anthrax	1	Pellagra	1
Chicken-pox	201	Pneumonia, lobar	132
Diphtheria	374	Scarlet fever	207
Dog-bite requiring anti-rabic treatment	8	Septic sore throat	4
Encephalitis lethargica	2	Smallpox	1
Epidemic cerebrospinal meningitis	5	Syphilis	64
German measles	2	Suppurative conjunctivitis	12
Gonorrhea	144	Tuberculosis, pulmonary	5
Influenza	10	Tuberculosis, other	139
Measles	321	Typhoid	29
Mumps	121	Whooping cough	25

DISEASES REPORTED TO MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH.

Week Ending November 25, 1922.

Disease.	No. of Cases.	Disease.	No. of Cases.
Anterior poliomyelitis	2	Pneumonia, lobar	132
Chicken-pox	47	Scarlet fever	230
Diphtheria	305	Septic sore throat	2
Dog-bite requiring anti-rabic treatment	8	Syphilis	39
Encephalitis lethargica	1	Suppurative conjunc-	
Epidemic cerebrospi-		tivitis	2
nal meningitis	4	Tuberculosis, pulmo-	
German measles	8	nary	135
Gonorrhea	77	Tuberculosis, other	
Influenza	18	forms	16
Measles	338	Typhoid	18
Mumps	118	Whooping cough	263
Ophthalmia neonato-			
rum	17		

THE NATIONAL BOARD OF MEDICAL EXAMINERS announces the following dates for its next examinations: Part 1: February 12, 13 and 14, 1923. Part 11: February 15 and 16, 1923.

The fees for these examinations have been continued at the reduced rate for another year. Applications for these examinations must be forwarded not later than January 1, 1923. Application blanks and circulars of information may be obtained from the Secretary of the National Board, Dr. J. S. Rodman, Medical Arts Building, Philadelphia, Pa.

J. S. RODMAN, Secretary.

INSPECTOR, ANTINARCOTIC ACT. AGENT, ANTINARCOTIC ACT.

The United States Civil Service Commission announces open competitive examinations for the positions listed above. Receipt of applications to close December 31, 1922. Vacancies in the Internal Revenue Service of the Treasury Department, at the salaries indicated below, and in positions requiring similar qualifications, at these or higher or lower salaries, will be filled from the interest of the service to fill any vacancy by reinstatement, transfer, or promotion.

The entrance salaries for both inspectors and agents will range from \$1,800 to \$2,250 a year (plus "bonuses"), with allowance for subsistence and actual necessary traveling expenses when away from post of duty on official business.

TRANSPORTATION TO SAN FRANCISCO NEXT JUNE.

The American Medical Association will hold its next annual session in San Francisco, June 25 to 30, 1923. Dr. Wendell C. Phillips, of 40 West 47th Street, New York, one of the trustees, is organizing a committee from the Eastern States to arrange for transportation to and from that meeting. He will be glad of the views of the Fellows of the Massachusetts Medical Society as to the sort of tours that would find most favor.

(Signed) Walter L. Burrage, Secretary.
November 27, 1922.

BOSTON CITY HOSPITAL.—Staff Clinical Meeting, Cheever Surgical Amphitheatre, Thursday, December 14, 1922, at 8 P.M. Myocarditis, Francis W. Peabody; Mediastinal Tumors, Henry Jackson, Jr.; Spastic and Atonic Constipation, Percy B. Davidson. Open discussion. Physicians and surgeons invited. Refreshments served 9:30 P.M.

JOHN J. DOWLING, Superintendent.

SOCIETY MEETINGS. DISTRICT SOCIETIES.

A list of society meetings is herewith published. This list will be changed on information furnished by the secretaries of the societies, and will appear in each issue.

Barretable District:—Hyannis,—February 2, 1923, (Annual Meeting)—May 4, 1923.

Bristol South District:—Fall River,—May 3, 1923.

Essex North District:—Haverhill, (Semi-Annual Meeting)—January 3, 1923. Y. M. C. A. Building, Lawrence, (Annual Meeting)—May 2, 1923.

Essex South District Medical Society meets Wednesday, December 13th, at Beverly Hospital, Beverly, 8 P.M. Speakers: Dr. W. P. Bowers, Managing Editor *Boston Medical and Surgical Journal*; Dr. John D. Adams, Boston; Dr. P. F. Johnson, Beverly, R. E. Stone, Secretary.

Suffolk District:—December 27, 1922; January 31, 1923; February 28, 1923; March 28, 1923; Annual Meeting, April 25, 1923.

The Springfield Academy of Medicine meets the second Tuesday of each month. Schedule of speakers includes the following names: Dr. Alexis Carrel, Dr. W. B. Long, Dr. J. W. Williams, Dr. W. S. Thayer, and Dr. Barton Cooke, Hist. The date for each speaker has not been assigned.

Middlesex North District:—Meeting, Wednesday, January 31, 1923.

Middlesex East District:—Jan. 24, 1923. The Nursing Problem. Speaker to be announced later.

March 21, 1923. Mental Factors in Childhood. Paper by Dr. William Healy.

April 18, 1923. Interpretation of Laboratory Findings. Papers by Dr. E. G. Crabtree and one to be announced later.

May 9, 1923. Annual Meeting.

All meetings except the annual meeting will be held at the Harvard Club in Boston. A. E. Small, Secretary.

Worcester District Meetings are scheduled as follows:

December 13, 1922:—The meeting will be held in the G. A. R. Hall, Pearl Street. Programme: "Prostatectomy," Dr. J. D. Barney of Boston; "Anomalies of the Kidney," Dr. Walter D. Rieberback; "A Series of Interesting Pyelograms in Genito-Urinary Lesions," Dr. Philip H. Cook.

January 10, 1923:—The meeting will be held at the Worcester State Hospital, Belmont Street, at 4:15 P.M. Programme: "A Discussion of Status Typhico-Lymphaticus and the Inherent Compensatory Possibilities," Dr. Walter Timme, New York City. Discussion will be opened by Dr. W. A. Brown.

February 14, 1923:—The meeting will be held at the Worcester City Hospital at 4:15 P.M. The programme will consist of a series of papers by members of the staff.

March 14, 1923:—The meeting will be held at St. Vincent's Hospital at 8:15 P.M. The programme will consist of a series of papers by members of the staff.

April 11, 1923:—The meeting will be held at Memorial Hospital at 8:15 P.M., and the programme will consist of a series of papers by members of the staff.

May 9, 1923:—Annual meeting and banquet.

STATE, INTERSTATE AND NATIONAL SOCIETIES.

December, 1922:—New England Dermatological Society Meeting, Wednesday, December 13, 1922, at 3:30 P. M., in the Surgical Amphitheatre, Boston City Hospital; C. Guy Lane, Secretary.

December 26-30, 1922:—American Association for Advancement of Science meets in Boston.

December, 1922:—Boston Medical History Club will meet December 18, 1922.

January, 1923:—Massachusetts Society of Examining Physicians (date and place undecided); Hilbert F. Day, Secretary. Massachusetts Association of Boards of Health, January 25, Annual Meeting, Boston; W. H. Allen, Mansfield, Mass., Secretary.

January, 1923:—Boston Association of Cardiac Clinics. Meeting January 18, 1923, at 8:15 P.M. Boston Lying-In Hospital (New Hospital). Subject: Pregnancy and Heart Disease.

January, 1923:—Boston Medical History Club will meet January 15, 1923.

February, 1923:—New England Dermatological Society Meeting, February 14, 1923, at 3:30 P. M., in the Skin Out-Patient Department, Massachusetts General Hospital; C. Guy Lane, Secretary.

February, 1923:—Boston Medical History Club will meet the third Monday of this month.

March, 1923:—Massachusetts Society of Examining Physicians (date and place undecided); Hilbert F. Day, Secretary.

March, 1923:—Boston Association of Cardiac Clinics. Meeting March 15, 1923, at 8:15 P.M. Boston City Hospital. Subject: Prevention and Relief of Heart Failure.

March, 1923:—Boston Medical History Club will meet the third Monday of this month.

April, 1923:—New England Dermatological Society Meeting, April 11, 1923, at 3:30 P. M., in the Surgical Amphitheatre, Boston City Hospital; C. Guy Lane, Secretary.

April, 1923:—Boston Medical History Club will meet the third Monday of this month.

May, 1923:—Massachusetts Society of Examining Physicians (date and place undecided). American Pediatric Society Meeting, May 31, June 1 and 2, 1923, at French Lick Springs Hotel, French Lick, Ind.; H. C. Carpenter, Secretary.

May, 1923:—Boston Association of Cardiac Clinics. Meeting May 17, 1923, at 8:15 P.M. Children's Hospital. Subject: Rheumatism and Chorea and Heart Disease.

June, 1923:—American Medical Association, San Francisco, June 25-29, 1923; Alexander R. Craig, Chicago, Ill., Secretary.

July, 1923:—Massachusetts Association of Boards of Health, July 20, Nantasket; W. H. Allen, Mansfield, Mass., Secretary.

*Deceased September 2, 1922.